The Commercial Car Journal

VOLUME XVII | PHILADELPHIA, AUGUST 15, 1919 | NUMBER 6

Where Approximately $350,000,000 is to be Spent on Roads This Year

Of This Amount, Over $200,000,000 Has Been Raised by State Bond Issues and Over $100,000,000 by County Bond Issues

IN this issue we have devoted a number of pages to a subject that should be uppermost in the mind of the motor truck dealer. Every motor truck dealer should be conversant with the road construction that is going on in his territory for the reason that with the increase of good roads, in his section, the potentiality of motor truck sales is increased. There are a great many dealers who have not, as yet, visualized the future of the motor truck industry and the great sales resistance that poor roads are responsible for. Within another six months a great many of the roads that have formerly been impassable to motor trucks, will have been completed and open for the use of economic motor truck transportation.

The motor truck dealer should remember that there are going to be prospects on both sides and at the ends of each improved and newly built road.

Although the sum of $350,000,000 is to be spent this year at the outside, this is merely a drop in the bucket in comparison with the amount of money that will eventually have to be expended to put our roads on a basis to compare favorably with the roads, for example, of France or England. Although the United States leads all nations in the amount of railroad mileage, yet the total amount of our improved highways is very small. This all goes to show that there are still tremendous possibilities for the sale of motor trucks and the necessity for a greatly increased road building program. Nevertheless we have made a good start and it is up to the motor truck industry from the manufacturer down to the ultimate consumer to work and vote for any legislation that will be productive of more good roads. In other words, the more roads we build, the more motor trucks can be sold. At the present time we have about 2,500,000 miles of roadway, about 12 per cent. of which might be termed "improved." Figuring on a ratio of two miles of public highway, on each square mile of area, which applies in developed territory, we should eventually have more than 5,000,000 miles of highway in this country. Considering, however, that we have only 20,000 miles of improved highway, it goes to show that we cannot expect to boast of any exceptional highway improvement to amount to anything unless greater appropriations are made for this work.

A great deal of criticism has been passed on the method of distributing funds by the Government for road construction. The Federal Aid plan is considered inadequate, in that it does not provide for the continuation of roads across state boundaries. To overcome this condition the National Highway bill has been introduced by Senator Townsend. This bill, which has been commented upon in these columns in previous issues, is now pending in the Senate.

It is an entirely new piece of legislation. Its object is to build in each state, trunk line highways to the extent of not less than two per cent. nor more than five per cent. of the total mileage of the state, and to join them with the main trunk lines of other states, thus creating a national system connecting the entire country.

In view of the fact that many state legislatures are still in session and many highway bills are still pending, it is impossible to give accurate figures on the total amount of money to be spent this year, but we believe that the figures given on the following pages are about as accurate as can be obtained under existing conditions. As will be noticed on one of the tables, there are a great many state bond issues still pending; others have been referred back to the people, some will be voted on within the next six months and the others not until the fall of next year. However, by checking up all of the information submitted by the State Highway Department, our

Bond issues finally ratified to date are as follows:

Oregon	$10,000,000
*Oregon	2,500,000
Nevada	1,000,000
Utah	4,000,000
California	40,000,000
Wyoming	2,800,000
Michigan	50,000,000
Illinois	60,000,000
Maryland	3,000,000
Pennsylvania	50,000,000
Total	$223,300,000

*Special appropriation for Roosevelt Memorial Highway.

Bond issues referred to the people are:

*Washington	$30,000,000
**Idaho	2,000,000
**Colorado	5,000,000
**New Mexico	2,000,000
*Texas	75,000,000
**Minnesota	100,000,000
**West Virginia	40,000,000
**Missouri	60,000,000
*Maine	8,000,000
Total	$322,000,000

*To be voted on this year.
**To be voted 1920.

Bond issues vetoed or defeated are:

Arizona	$30,000,000
New York	20,000,000
Tennessee	50,000,000
South Carolina	25,000,000
Montana	10,000,000
Oklahoma	50,000,000
Total	$185,000,000

Bond issues now under consideration or shortly to be are:

Arkansas	$15,000,000
Alabama	25,000,000
Georgia	40,000,000
Florida	10,000,000
Virginia	50,000,000
Kansas	60,000,000
Minnesota	100,000,000
Mississippi	20,000,000
Wisconsin	50,000,000
North Dakota	50,000,000
North Carolina	25,000,000
Missouri	60,000,000
Total	$505,000,000

figures show that the actual amount of money spent will not exceed $350,000,000.

If all the bonds that the various states proposed had been carried, the total would have reached the magnificent sum of $1,500,000,000 of state bonds alone. Of this amount however, only $223,300,000 has been authorized.

It is interesting to note that over $100,000,000 in bonds have been raised by the various counties throughout the country. In the County of Dallas, Texas, $6,500,000 was voted. Although the amount of money to be spent on roads this year shows to a very marked degree the interest the public has taken in highways, there is still a condition to be met with which the people of the country will have to deal before long, and that is, that in all of these expenditures for road building this year, up to 1921, no provision has been made for the building of roads to take care of interstate commerce.

It is for this reason that a Federal Highway Commission and a national system of highways must be created to particularly take care of the interstate travel.

It is also imperative that money spent for roads should be put into roads that will stand up under the strain of heavy truck traffic, otherwise a great deal of dissatisfaction will spring up among taxpayers, with the result that future appropriations will be difficult to obtain.

Apportionment of Federal Aid Funds by States

The Post Office appropriation bill for the fiscal year 1920, as passed, contains the roads amendment, increasing the amount of Federal Aid funds by $200,000,000 and funds for forest reservation roads by $9,000,000. It also broadens the definition of a rural post road, and raises the limit of Federal contribution from "not to exceed $10,000" to "not to exceed $20,000 a mile." The apportionment of funds now available for Federal Aid roads among the States are given in the following table:

States.	Amount available for fiscal years 1917, 1918, 1919.	$50,000,000 additional fiscal year 1919.	Totals for fiscal year 1919.	Fiscal year 1920 allotment.	Fiscal year 1920 additional $75,000,000.	Fiscal year 1920 totals.	Fiscal year 1921 allotment.	Fiscal year 1921 additional $75,000,000.	Totals for fiscal year 1921.	Grand total.
Alabama	$625,903.17	$1,050,264.10	$1,676,167.27	$420,105.64	$1,575,396.15	$1,995,501.79	$525,132.05	$1,575,396.15	$2,100,528.20	$5,772,197.26
Arizona	411,081.14	685,043.57	1,096,124.71	274,017.43	1,027,565.36	1,301,582.79	342,521.79	1,027,565.36	1,370,087.15	3,767,794.65
Arkansas	498,085.77	840,229.53	1,338,315.30	336,091.81	1,260,344.30	1,596,436.11	420,114.76	1,260,344.30	1,680,459.06	4,615,210.47
California	909,358.99	1,524,248.30	2,433,607.29	609,699.32	2,286,372.45	2,896,071.77	762,124.15	2,286,372.45	3,048,496.60	8,378,175.66
Colorado	508,349.34	867,570.90	1,375,920.24	347,028.36	1,301,356.35	1,648,384.71	433,785.45	1,301,356.35	1,735,141.80	4,759,446.75
Connecticut	185,487.77	307,064.65	492,552.42	122,825.86	460,596.98	583,422.84	153,532.32	460,596.98	614,129.30	1,690,104.56
Delaware	48,965.10	81,384.45	130,349.55	32,553.78	122,076.68	154,630.46	40,692.22	122,076.68	162,768.90	447,748.91
Florida	338,652.69	573,797.20	912,449.89	229,518.88	860,695.80	1,090,214.68	286,898.60	860,695.80	1,147,594.40	3,150,258.97
Georgia	806,897.89	1,346,044.75	2,152,942.64	538,417.90	2,019,067.12	2,557,485.02	673,022.38	2,019,067.12	2,692,089.50	7,402,517.16
Idaho	363,862.05	610,509.27	974,371.32	244,203.71	915,763.91	1,159,967.62	305,254.64	915,763.91	1,221,018.55	3,355,357.49
Illinois	1,321,102.17	2,185,550.65	3,506,652.82	874,220.26	3,278,325.97	4,152,546.23	1,092,775.32	3,278,325.97	4,371,101.29	12,030,300.34
Indiana	813,473.04	1,349,919.40	2,163,392.44	539,967.76	2,024,879.10	2,564,846.86	674,959.70	2,024,879.10	2,699,838.80	7,428,078.10
Iowa	873,180.41	1,443,046.20	2,316,226.61	577,218.48	2,164,569.30	2,741,787.78	721,523.10	2,164,569.30	2,886,092.40	7,944,106.79
Kansas	858,754.08	1,436,313.93	2,295,068.01	574,525.57	2,154,470.89	2,728,996.46	718,156.96	2,154,470.89	2,872,627.85	7,896,692.32
Kentucky	585,400.35	976,865.17	1,562,265.52	390,746.07	1,465,297.76	1,856,043.83	488,432.59	1,465,297.76	1,953,730.35	5,372,039.70
Louisiana	406,179.27	680,729.03	1,086,908.30	272,291.61	1,021,093.55	1,293,385.16	340,364.51	1,021,093.55	1,361,458.06	3,741,751.52
Maine	290,161.92	481,231.35	771,393.47	192,492.62	721,847.33	914,339.95	240,615.78	721,847.33	962,463.11	2,648,196.53
Maryland	263,013.09	434,737.02	697,750.11	173,894.81	652,105.53	826,000.34	217,368.51	652,105.53	869,474.04	2,393,224.49
Massachusetts	442,814.70	736,883.30	1,179,698.00	294,753.32	1,105,324.95	1,400,078.27	368,441.65	1,105,324.95	1,473,766.60	4,053,542.87
Michigan	872,707.53	1,447,213.80	2,319,921.33	578,885.52	2,170,820.70	2,749,706.22	723,606.90	2,170,820.70	2,894,427.60	7,964,055.15
Minnesota	853,047.58	1,420,774.53	2,273,822.11	568,309.81	2,131,161.80	2,699,471.61	710,387.26	2,131,161.80	2,841,549.06	7,814,642.78
Mississippi	535,469.12	899,488.26	1,434,957.38	359,795.31	1,349,232.39	1,709,027.70	449,744.14	1,349,232.39	1,798,976.53	4,942,961.61
Missouri	1,017,765.21	1,695,314.11	2,713,079.32	678,125.64	2,542,971.14	3,221,096.78	847,657.05	2,542,971.14	3,390,628.19	9,324,804.29
Montana	593,382.46	999,467.15	1,592,847.61	399,786.86	1,499,200.73	1,898,987.59	499,733.58	1,499,200.73	1,998,934.31	5,490,771.51
Nebraska	639,757.68	1,066,642.07	1,706,399.75	426,656.83	1,599,963.10	2,026,619.93	533,321.04	1,599,963.10	2,133,284.14	5,866,303.82
Nevada	386,424.72	642,933.45	1,029,358.17	257,173.38	964,400.18	1,221,573.56	321,466.72	964,400.18	1,285,866.90	3,536,798.63
New Hampshire	125,599.97	207,810.38	333,410.35	83,124.15	311,715.57	394,839.72	103,905.19	311,715.57	415,620.76	1,143,870.83
New Jersey	354,995.26	594,050.80	949,046.06	237,620.32	891,076.20	1,128,696.52	297,025.40	891,076.20	1,188,101.60	3,265,844.18
New Mexico	474,847.98	798,785.78	1,273,633.76	319,514.31	1,198,178.67	1,517,692.98	399,392.89	1,198,178.67	1,597,571.56	4,388,898.30
New York	1,501,835.01	2,487,956.40	3,989,791.41	995,182.56	3,731,934.60	4,727,117.16	1,243,978.20	3,731,934.60	4,975,912.80	13,692,821.37
North Carolina	685,702.23	1,139,977.47	1,825,679.70	455,990.99	1,709,966.20	2,165,957.19	569,988.74	1,709,966.20	2,279,954.94	6,271,591.83
North Dakota	458,015.09	768,360.27	1,226,375.37	307,344.11	1,152,540.42	1,459,884.53	384,180.14	1,152,540.42	1,539,720.56	4,222,980.46
Ohio	1,118,759.68	1,854,462.47	2,973,222.15	741,784.99	2,781,693.71	3,523,478.70	927,231.24	2,781,693.71	3,708,924.95	10,205,625.80
Oklahoma	691,906.34	1,153,055.50	1,844,961.84	461,222.20	1,729,583.25	2,190,805.45	576,527.75	1,729,583.25	2,306,111.00	6,341,878.29
Oregon	472,394.85	787,459.10	1,259,853.95	314,983.64	1,181,188.65	1,496,172.29	393,729.55	1,181,188.65	1,574,918.20	4,330,944.44
Pennsylvania	1,382,078.29	2,296,075.85	3,678,154.14	918,430.34	3,444,113.77	4,362,544.11	1,148,037.92	3,444,113.77	4,592,151.69	12,632,849.94
Rhode Island	69,969.51	116,530.95	186,500.46	46,612.38	174,796.43	221,408.81	58,265.48	174,796.43	233,061.91	640,971.18
South Carolina	430,437.00	717,297.05	1,147,734.05	286,918.82	1,075,945.58	1,362,864.40	358,648.52	1,075,945.58	1,434,594.10	3,945,192.55
South Dakota	486,013.67	810,720.68	1,296,734.35	324,288.27	1,216,081.02	1,540,369.29	405,360.34	1,216,081.02	1,621,441.36	4,458,545.00
Tennessee	683,123.95	1,132,103.50	1,815,227.45	452,841.40	1,698,155.25	2,150,996.65	566,051.75	1,698,155.25	2,264,207.00	6,230,431.10
Texas	1,752,770.13	2,926,219.37	4,678,989.50	1,170,487.75	4,389,329.05	5,559,816.80	1,463,109.69	4,389,329.05	5,852,438.74	16,091,245.04
Utah	341,613.62	567,592.10	909,205.72	227,036.84	851,388.15	1,078,424.99	283,796.05	851,388.15	1,135,184.20	3,122,814.91
Vermont	136,662.33	225,987.70	362,650.03	90,395.08	338,981.55	429,376.63	112,993.85	338,981.55	451,975.40	1,244,002.06
Virginia	597,102.90	992,052.95	1,589,155.85	396,821.18	1,488,079.43	1,884,900.61	496,026.48	1,488,079.43	1,984,105.91	5,458,162.37
Washington	432,183.03	722,367.25	1,154,550.28	288,946.90	1,083,550.87	1,372,497.77	361,183.62	1,083,550.87	1,444,734.49	3,971,782.54
West Virginia	319,525.27	532,009.10	851,534.37	212,803.64	798,013.65	1,010,817.29	266,004.55	798,013.65	1,064,018.20	2,926,369.86
Wisconsin	767,790.41	1,272,946.53	2,040,736.94	509,178.61	1,909,419.79	2,418,598.40	636,473.26	1,909,419.79	2,545,893.05	7,005,228.39
Wyoming	367,396.24	612,912.45	980,308.69	245,164.98	919,368.68	1,164,533.66	306,456.22	919,368.68	1,225,824.90	3,370,667.25
Total	29,100,000.00	48,500,000.00	77,600,000.00	19,400,000.00	72,750,000.00	92,150,000.00	24,250,000.00	72,750,000.00	97,000,000.00	266,750,000.00
Administration	900,000.00	1,500,000.00	2,400,000.00	600,000.00	2,250,000.00	2,850,000.00	750,000.00	2,250,000.00	3,000,000.00	8,250,000.00
Grand total	30,000,000.00	50,000,000.00	80,000,000.00	20,000,000.00	75,000,000.00	95,000,000.00	25,000,000.00	75,000,000.00	100,000,000.00	275,000,000.00

Highway Funds Should be Under Central Control

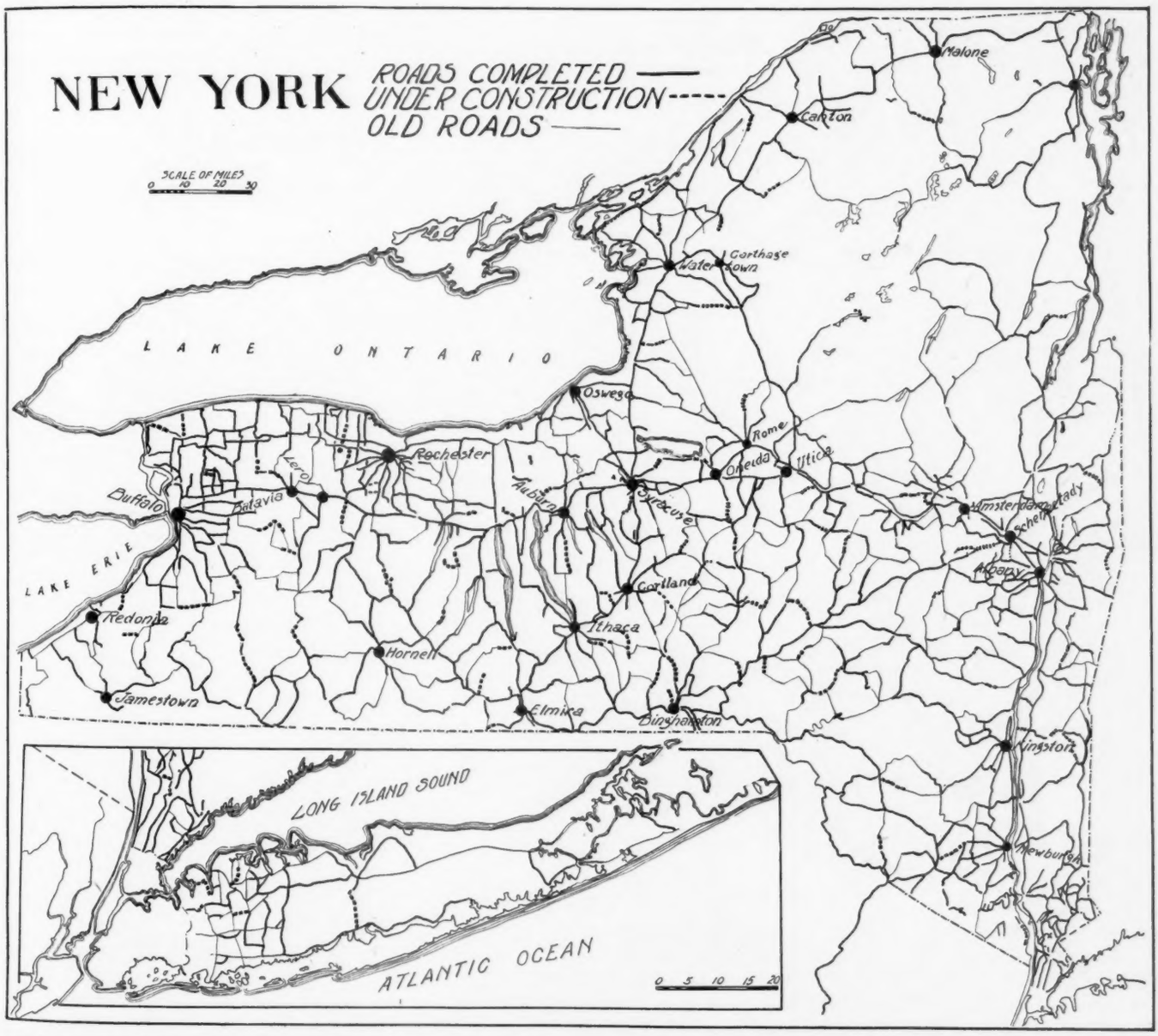
THAT the highway policy of the United States is not as flexible nor as well suited to meet the requirements of modern transportation as those of either France or England, was the statement made recently by Roy D. Chapin, chairman of highways committee of National Automobile Chamber of Commerce.

"In view of the greatly stimulated interest in highway development in this country, it is interesting to note that both France and England are far ahead of us in their administration of road funds," said Mr. Chapin.

"France, for example, has recently appropriated $152,000,000 for the repair and upkeep of 65,000 miles of roads and the national government which has always retained full control of the construction and maintenance of main highways, has gone a step further and has taken over the secondary system as well. This is in direct contrast to our present plan of operation, which in effect, distributes a sum of $273,000,000 over a three-year period on any part of 2,500,000 miles of road which local authorities may deem advisable, thus dividing control and expenditures over enormous mileage.

"A technical committee has been appointed to determine the kind of material necessary for each type of road and it is also probable that there will be a reclassification of highways according to recent advices from France.

"The French problem is, of course, more acute in a sense than ours, since thousands of miles of roadways were demolished during the war and must be replaced. But this very need which has caused the French government to assume full control in order to provide for the most efficient expenditure of every penny, is an indication of the course which the United States government should take. This it cannot do as long as we have a law which appropriates monies



All the maps shown in this issue have been obtained direct from the State Highway Department of each state. The inscriptions on each are self-explanatory. These maps show only the work being done on the main state highways. We shall continue the publication of these maps in future issues until all states have been covered.

among states and does not legally recognize the actual need for a national highway system which is now confronting us as a consequence of the enormous increase in interstate highway traffic.

"English authorities have also adopted an advanced stand in their treatment of the highway problem. The national government has appropriated $50,000,000 for use on national highways, requiring therewith a measure of local aid, but always holding national policies and purposes in the foreground. The entire subject of transportation has been made the subject of an elaborate investigation and it is not improbable that out of this will come sweeping changes in policies of administration, operation and construction of highways.

"In this country we have been content to treat the problem as one for sectional rather than national consideration instead of considering both elements.

"We can no longer continue this course without waste and inefficiency and the more quickly we adopt a plan of administration calling for a national highway system and a Federal highway commission, the better off we will be."

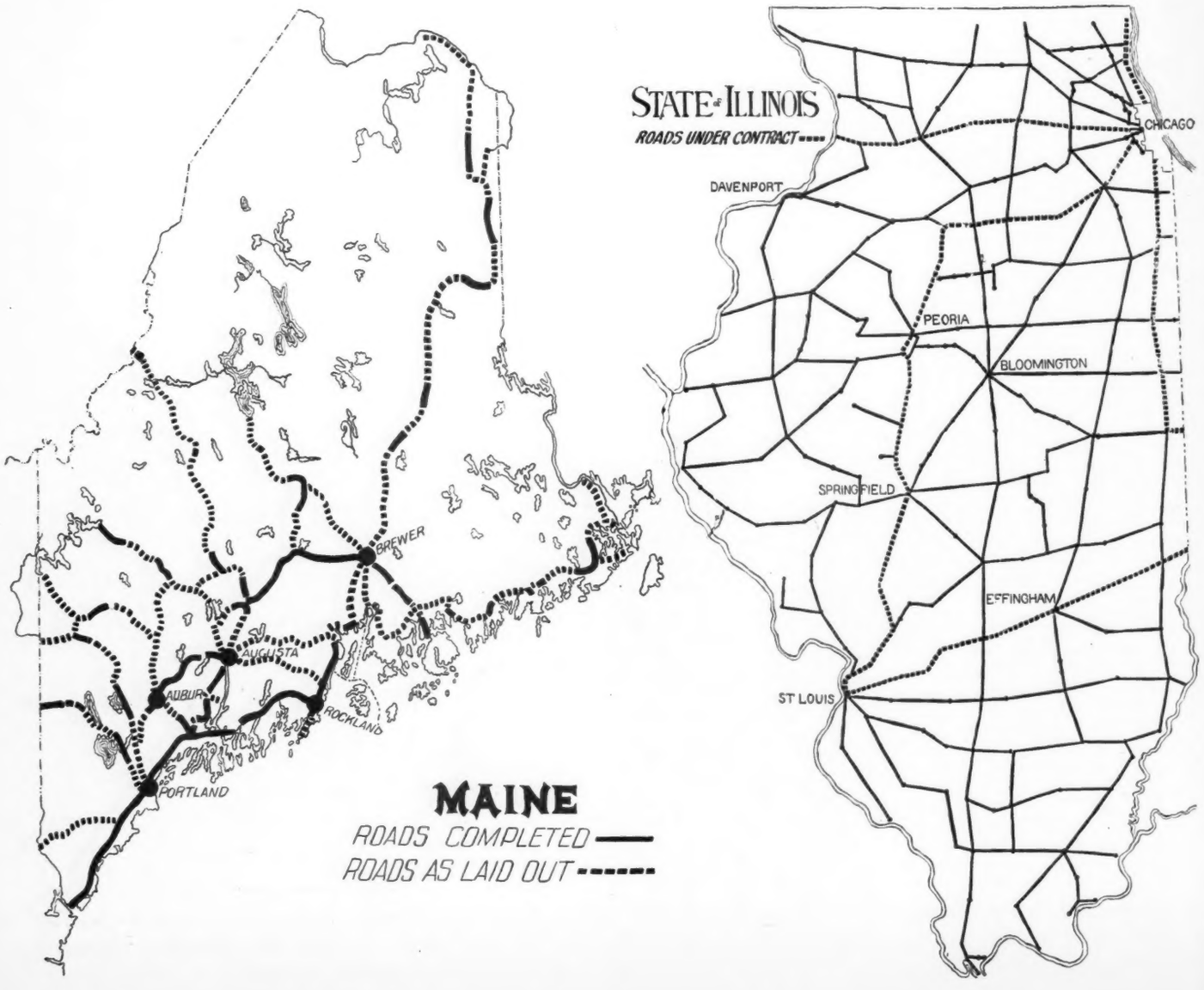
Contracts Awarded for Dixie Highway

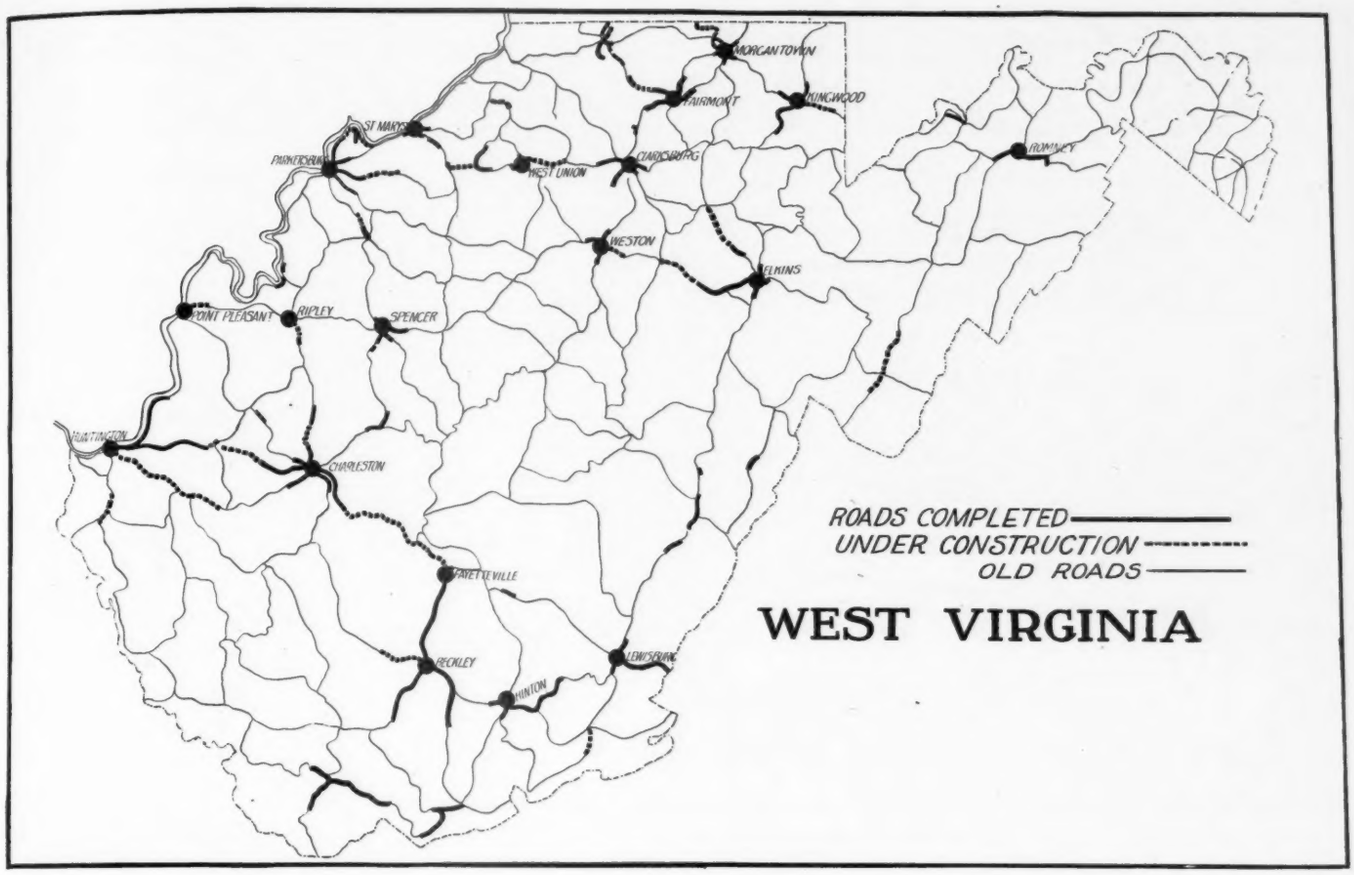
CHATTANOOGA, TENN., August 1.—Another step in the realization of a highway between Nashville and Chattanooga over Cumberland Mountain, which is now financially provided for at a proposed outlay of over $500,000 on the construction of the 47 miles, was taken by the state highway department of Tennessee in awarding the contracts on 29 miles of the highway in Bedford, Moore and Franklin counties. The plans and specifications for the remaining 18 miles of construction in Marion county have been completed and the Federal Aid projects have been filed. It is understood to be the intention of the Tennessee Highway Commission to use state convicts on the construction of Marion county's section of the highway, which consists largely of widening the grade which has been constructed from Monteagle down Cumberland Mountain and in relocating the grade over Walden's Ridge approaching Chattanooga. The use of convicts will also eliminate some of the steps which might cause delay in getting work started following the approval of the Federal Aid project.

When the Dixie Highway between Nashville and Chattanooga is completed, it will represent an outlay of over $1,000,000. Of the 167 miles, 90 miles is entirely new road which existed only on paper when this routing was selected by the Association four years ago. This includes the crossing of Cumberland Mountain and Walden's Ridge. The toll gates on forty miles additional have been removed. The new road will eliminate the old toll gates on both sides of Cumberland Mountain and the ferry across the Tennessee River.

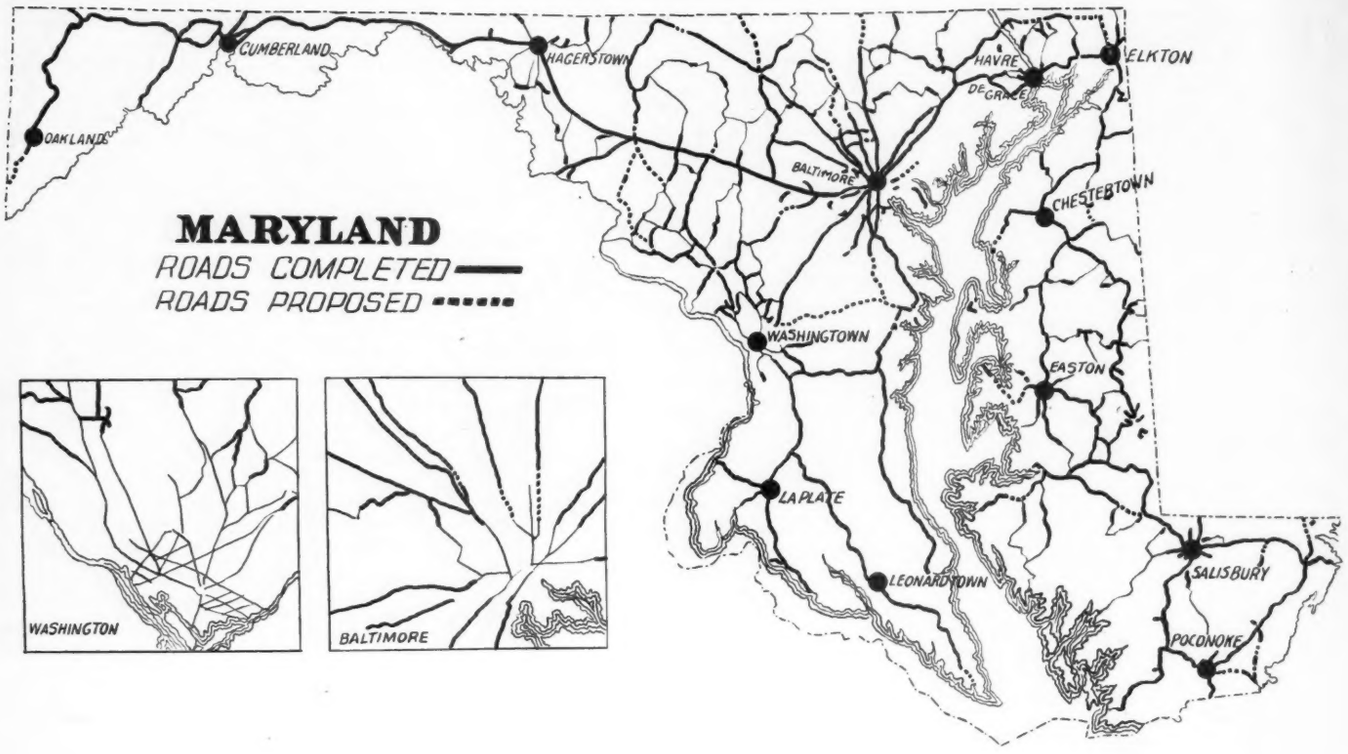
New York Commissioner Plans 25,000 Miles of Hard Roads

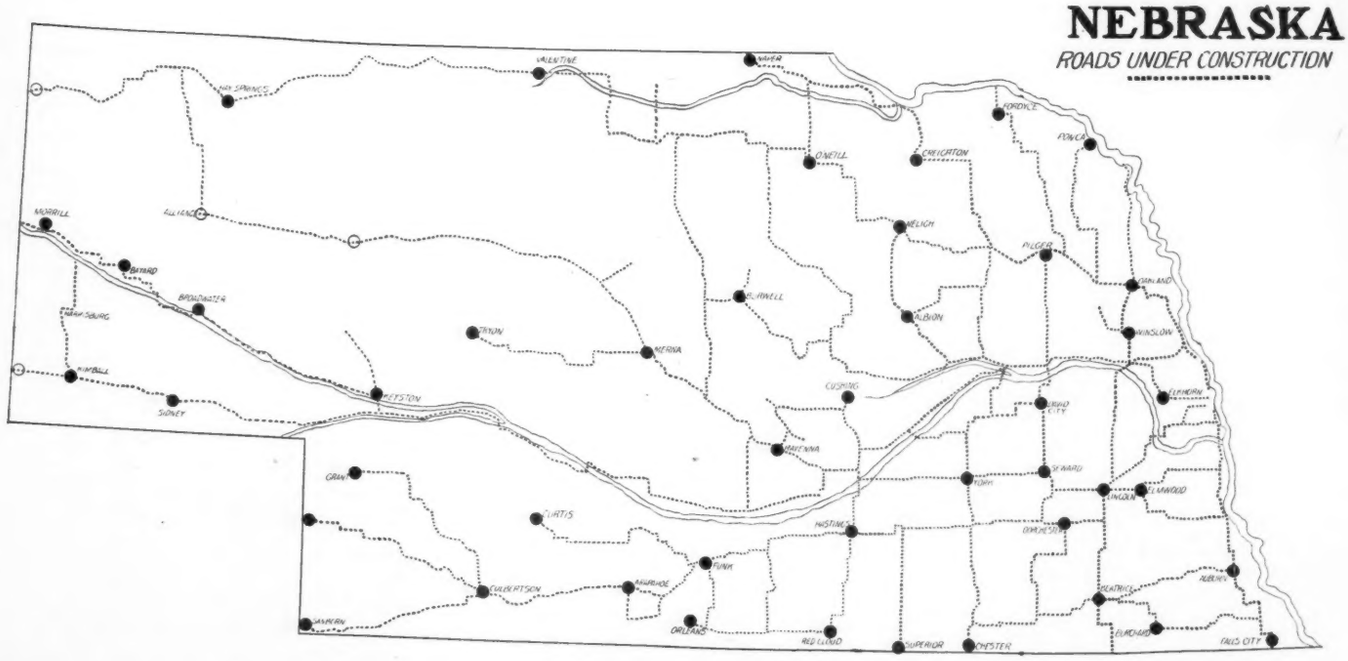
Frederick Stuart Greene, Commissioner of Highways of New York, is arranging to have constructed 25,000 miles of roads before the end of his term of office in 1925. He favors hard roads not less than 18 feet in width, saying that they will last for at least thirty years, while the cost for maintenance will be less than for other roads.




MORGANTOWN
FAIRMONT
KINGWOOD
ST MARYS
PARKERSBURG
WEST UNION
CLARKSBURG
ROMNEY
WESTON
ELKINS
POINT PLEASANT
RIPLEY
SPENCER
HUNTINGTON
CHARLESTON
FAYETTEVILLE
BECKLEY
LEWISBURG
HINTON
ROADS COMPLETED
UNDER CONSTRUCTION
OLD ROADS
WEST VIRGINIA


BELLINGHAM
OROVILLE
CURLEW
METALINE FALLS
MARBLEMOUNT
FORKS
SEATTLE
SPOKANE
DAVENPORT
WENATCHEE
TACOMA
CHETLO
HARBOR
DAYTON
PROSSER
WALLA WALLA
VANCOUVER
WASHINGTON
ROADS COMPLETED
ROADS UNDER CONSTRUCTION
OLD ROADS





Forest Service is to Expend $12,000,000 on Highways

Approximately $12,000,000 worth of road work is planned by the U. S. Forest Service for the current year. Some $8,000,000 of this represents accumulated funds and monies appropriated at the last session of Congress. The remainder is state and county aid which is rendered in varying proportions to the forestry funds according to the ability of the local community to pay, the type of road, the character of the traffic and other factors.

In all it is estimated that some 1643 miles of road will be improved or constructed. Estimating that each road serves an economic zone 10 miles in depth on either side of it, some 32,860 square miles of territory will thus either be given new recreational and economic outlets or will have existing highways greatly improved.

The provisions governing administration of these funds are much more liberal than those contained in the post road section of the Federal Aid act.

Forest funds may be used within or without Forest boundaries as long as they serve to afford an inlet thereto and if desired, they can be concentrated on a few projects which may overlap state boundaries.

The policy of the service takes into account national as well as state needs, hence while the forests are not sufficiently numerous to make possible the construction of a national highway, they do actually pave the way for interstate road construction.

The Following Information Was Received From the Highway Departments of Various States Listed

Alabama

Alabama's part of the Federal Aid is $5,772,197.26. The Legislature has been asked to pass a bill to authorize an election for the purpose of amending the Constitution to permit a $25,000,000 bond issue for the roads of the state.

California

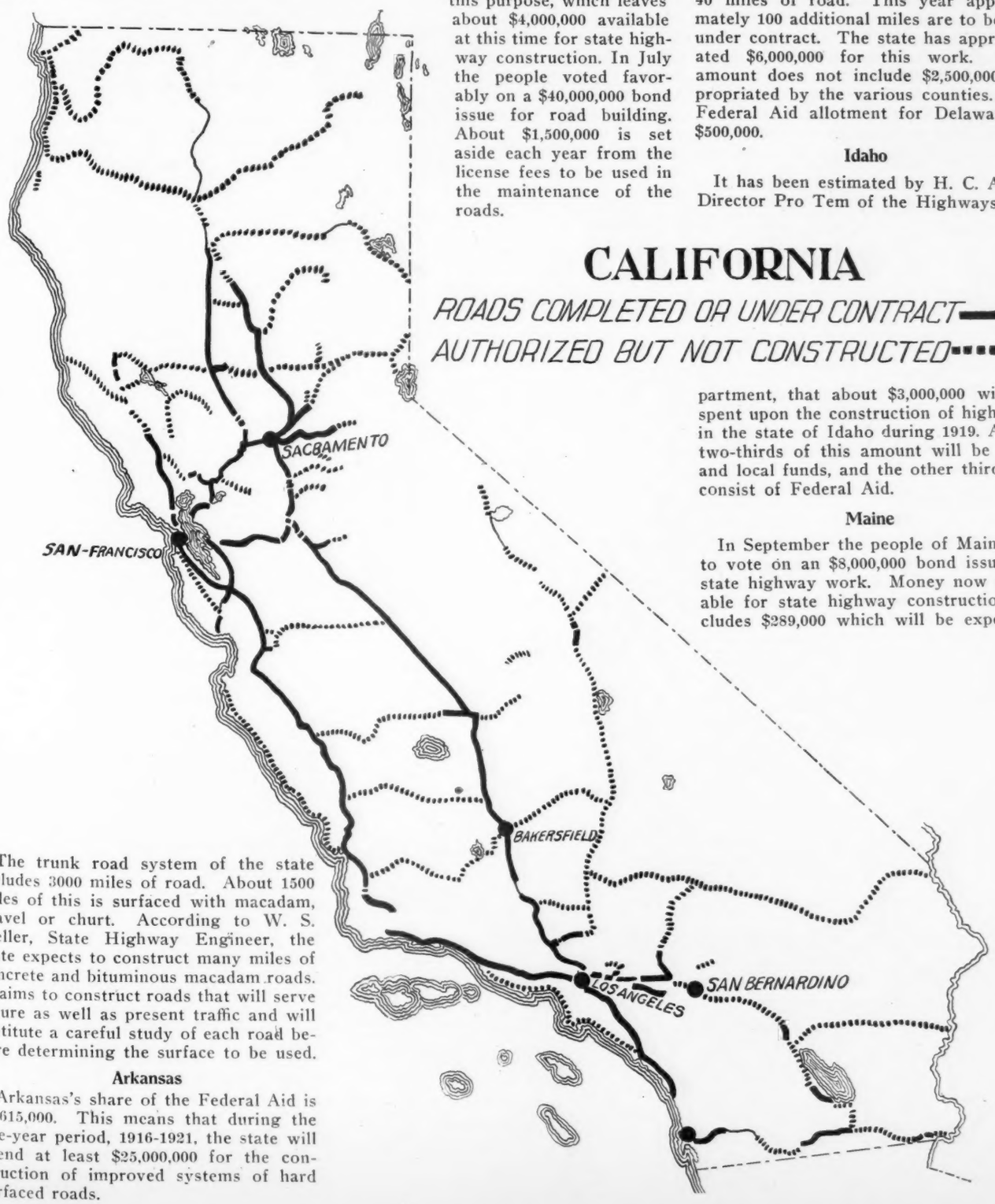
There have been two bond issues in California, one for $18,000,000 in 1909 and another for $15,000,000 in 1915. The proceeds of the first have all been expended on the roads. Of the latter approximately $11,600,000 has already been spent for this purpose, which leaves about $4,000,000 available at this time for state highway construction. In July the people voted favorably on a $40,000,000 bond issue for road building. About $1,500,000 is set aside each year from the license fees to be used in the maintenance of the roads.

Delaware

According to Charles M. Upham, Chief Engineer of the Highway Department, Delaware expects to complete her main line system of roads within the next two years. In spite of war conditions, contracts were awarded last year for about 40 miles of road. This year approximately 100 additional miles are to be put under contract. The state has appropriated $6,000,000 for this work. This amount does not include $2,500,000 appropriated by the various counties. The Federal Aid allotment for Delaware is $500,000.

Idaho

It has been estimated by H. C. Allen, Director Pro Tem of the Highways Department, that about $3,000,000 will be spent upon the construction of highways in the state of Idaho during 1919. About two-thirds of this amount will be state and local funds, and the other third will consist of Federal Aid.



Maine

In September the people of Maine are to vote on an $8,000,000 bond issue for state highway work. Money now available for state highway construction includes $289,000 which will be expended

The trunk road system of the state includes 3000 miles of road. About 1500 miles of this is surfaced with macadam, gravel or churt. According to W. S. Keller, State Highway Engineer, the state expects to construct many miles of concrete and bituminous macadam roads. It aims to construct roads that will serve future as well as present traffic and will institute a careful study of each road before determining the surface to be used.

Arkansas

Arkansas's share of the Federal Aid is $4,615,000. This means that during the five-year period, 1916-1921, the state will spend at least $25,000,000 for the construction of improved systems of hard surfaced roads.

in completing contracts existing at the end of last season. About $100,000 of this money will be refunded for Federal Aid, which make the total to be used for state highway construction almost $400,000.

The $500,000 state fund for State Aid has been apportioned to those cities and towns applying for it. This money is supplemented by an almost equal amount from the cities and towns, and there is approximately $400,000 of this State Aid remaining from last year.

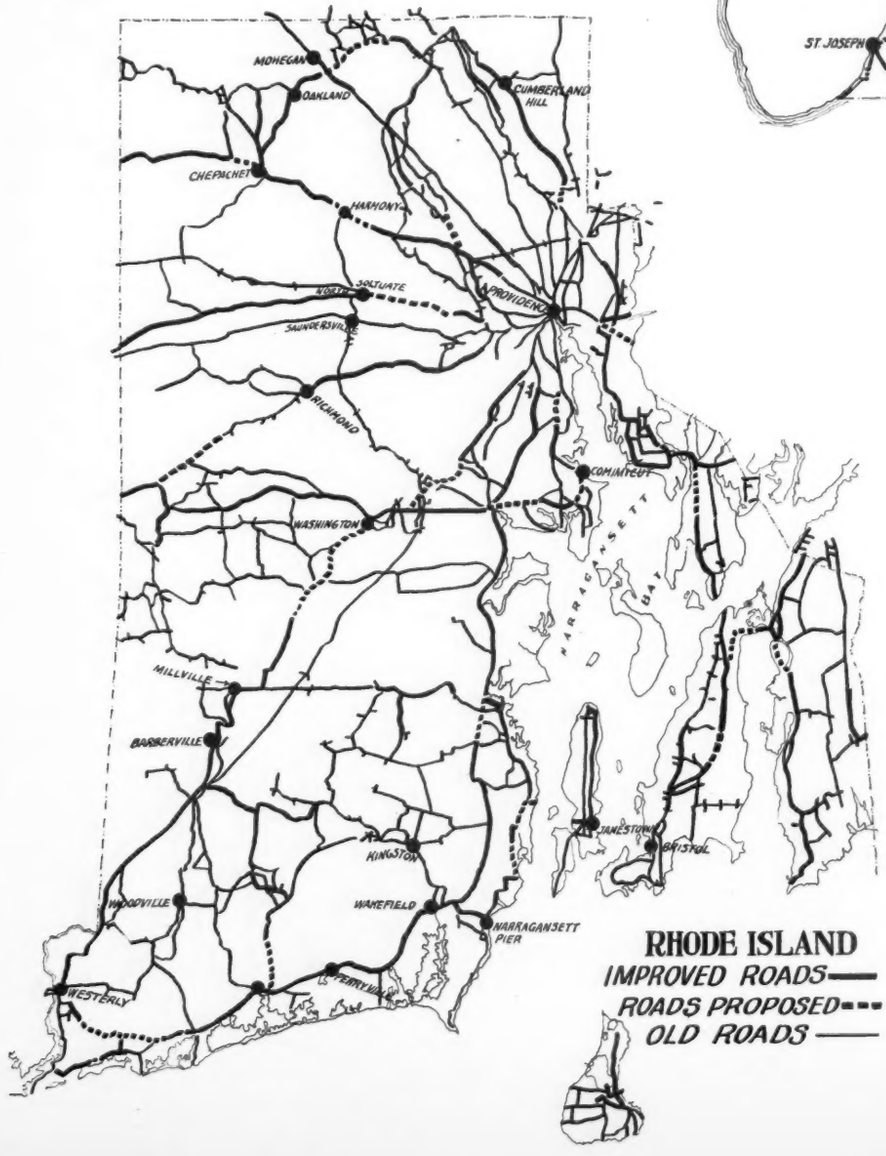
There is also a fund of $100,000 for the assistance of towns in the construction of bridges. The counties contribute to this fund, making the entire amount about $500,000.

The maintenance work is cared for by Patrol Maintenance and will cost about $600,000 this year, of which $40,000 is state money. The remainder is furnished by the cities and towns.

Massachusetts

The amount of money to be had in Massachusetts during the year 1919 for road construction is $6,000,000. This sum includes $1,200,000 Federal Aid money. The remainder has been appropriated by the state without the issuance of bonds.





Minnesota

In this state $1,980,000 has been apportioned as State Aid for highway construction. The counties have appropriated about $5,397,986. The Federal Aid allotment for this year is $3,551,936. Practically all of this fund will be spent on the State Road system, which includes almost 13,000 miles of main highway in the state. The greater portion of this will be the Trunk Highway system, which consists of 6900 miles of main arterial highways selected from the State Road system.

Mississippi

This state does not engage in road building as a state. The appropriation for highway purposes is merely to carry on the expenses of the Department.

In the next three years the state expects to spend, for road improvement, about $5,000,000—its share of the Federal Aid. The various counties will spend about $8,000,000, which is their pro rata share of the cost of construction of the roads upon which the Federal Aid is to be spent. Between $3,000,000 and $4,000,000 will likewise be spent on local improvement.

Missouri

The General Assembly of this state has appropriated $3,200,000 for road work for the next two years. The amount of Federal money available for this period will be $9,000,000.

The new road law which has been passed authorized the building of 6000 miles of roads in three years. The kind of road is to be decided upon by the counties voting the bonds and the State Highway Department.

Montana

Montana's Federal Aid allotment is approximately $1,500,000, exclusive of $4,000,000 allotted to the state by an amendment to the Federal Aid act, $1,000,000 of which is now available and $1,500,000 of which will be available on July 1st. Of this Federal Aid allotment $3,492,000 is available for use in 1919. Since this appropriation represents but one-half of project costs, if Federal cooperation funds can be secured, Montana's projects for 1919 construction will aggregate $7,000,000.

The Highway Commissioner of this state is practically without authority over existing roads, unless the improvement is accomplished by Federal Aid. This leaves almost all of the roads under the supervision and authority of county officials. There is not a single mile of "improved road" in Montana today, and all the work that will be accomplished this season, with the exception of four miles, will be either graded earth or gravel surfaced.

Nebraska

Nebraska has planned about 4500 miles of roads in her state highway system. There has been appropriated for the years 1919 and 1920, $3,093,263. This sum is to match an equal amount of Federal Aid. In addition to this fund, the automobile license fees are to be used for road improvement. About $2,500,000 is provided in this way.

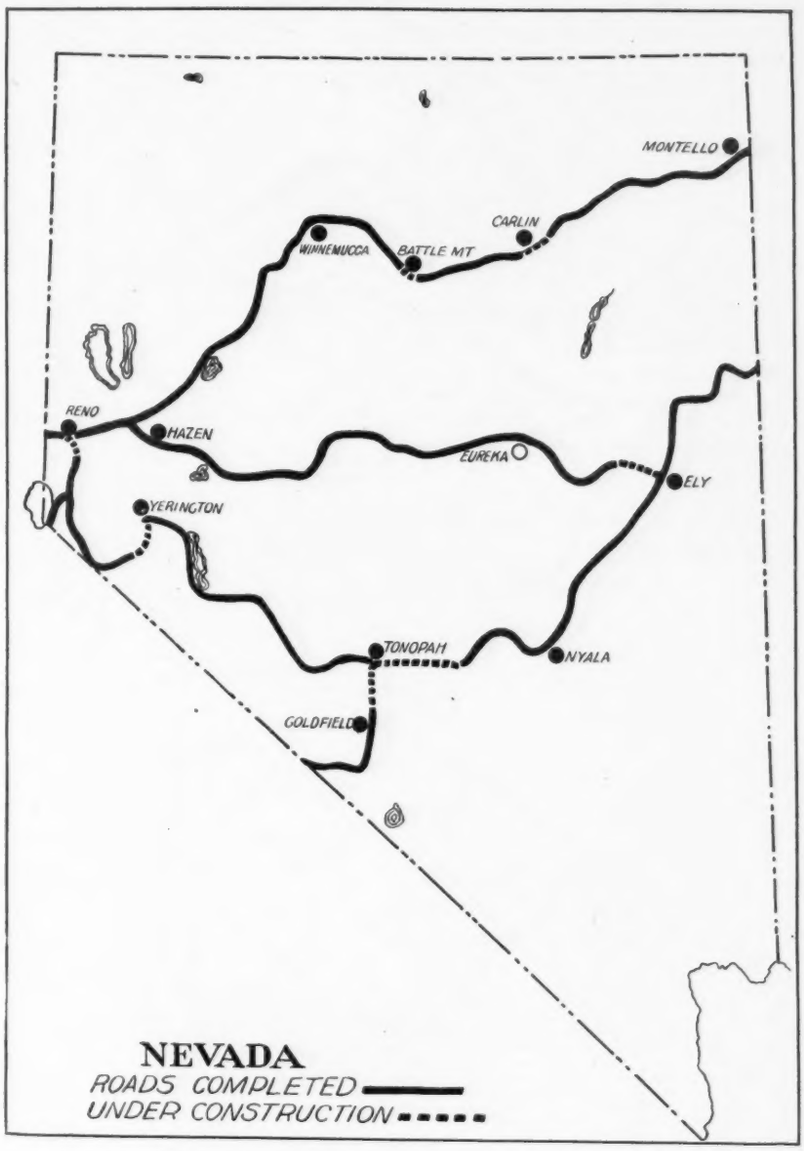
New Jersey

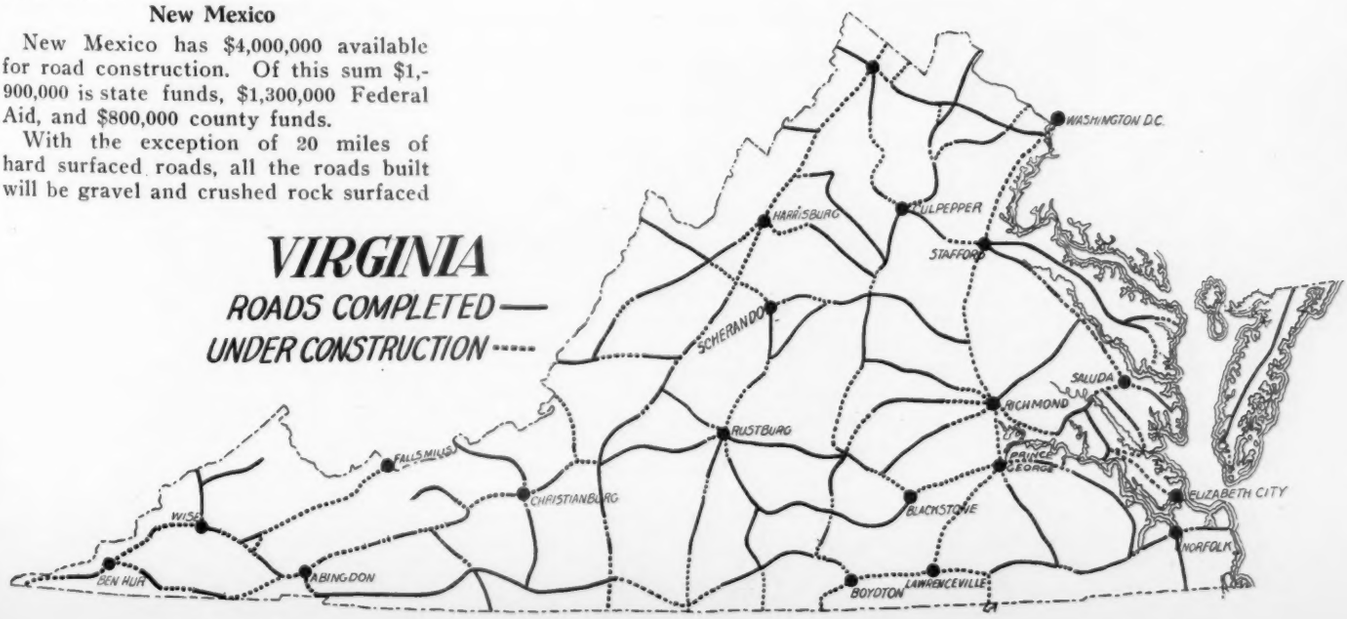
New Jersey has a fund of approximately $6,500,000 for this year's highway construction program. This amount includes a state road tax of $3,000,000, a State Aid appropriation of $500,000, a motor vehicle maintenance fund of $2,000,000, and $1,000,000, Federal Aid. The counties must duplicate the State Aid and the maintenance, making a total available fund of $9,000,000. This will be used to complete unfinished contracts from last year and build about 100 miles of additional roads. The majority of contracts are for Portland cement concrete roads.

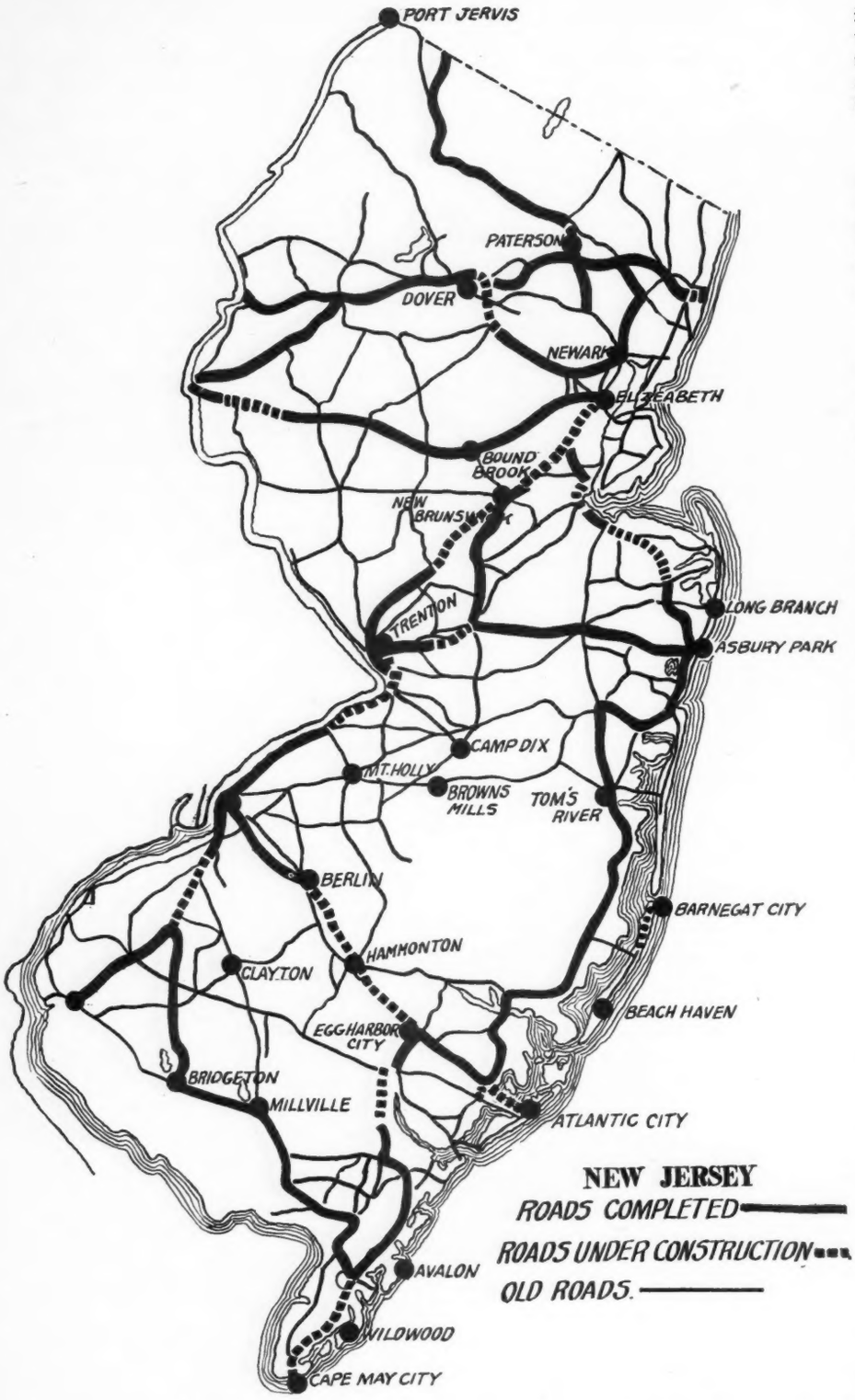
New Mexico

New Mexico has $4,000,000 available for road construction. Of this sum $1,900,000 is state funds, $1,300,000 Federal Aid, and $800,000 county funds.

With the exception of 20 miles of hard surfaced roads, all the roads built will be gravel and crushed rock surfaced







New York

According to Royal K. Fuller, Secretary of the State of New York Commission of Highways, this state will spend about $10,000,000 on road construction this year. This sum includes $500,000 Federal Aid. The policy of the Commission seems to be to build roads of concrete wherever possible.

North Carolina

W. S. Fallis, State Highway Engineer, estimates that there will be about $5,000,000 spent on highway construction during the year. This includes $2,165,000 of Federal Aid. The Commission hopes to have hard surfaced roads constructed wherever possible.

Oregon

Oregon's Federal Aid amounts to $2,600,000, which, when matched by an equal amount, will be spent in the construction of post roads. There is available from taxation, $250,000; from license fees, $500,000, and from the bond issue of 1917, $3,500,000. About $2,000,000 of the bond issue of 1919 may also be expended in road construction. It is estimated that the counties will spend about $10,000,000.

A large amount of the work of the State Highway Commission will consist in paving the main trunk highways. This will involve grading many hundreds of miles of highways and very heavy construction. Some of this work will cost $50,000 a mile.

Rhode Island

The state funds available for road construction total $840,000. The Federal Aid allotment is $645,000. No definite plan of work has been formulated as yet, but it is thought that most of the work will be cement and bituminous concrete, sheet asphalt and bituminous macadam.

New Hampshire

This state has $602,000 allotted to it by Federal Aid. A like amount will be raised by the state and towns. Outside of Federal Aid about $4,000,000 will be expended for construction and about one-half million for maintenance.

Texas

The Federal Aid for this state will amount to $16,091,000 for the next two years. There is a $3,000,000 state fund now available for road construction. To date there has been voted and proposed $40,000,000 worth of county road bonds. The people are to vote on a $75,000,000 bond issue at the November election. Thus far a budget system for the proposed work has not been compiled, but the state aims to construct hard surfaced roads only.

Virginia

About $3,000,000 has been appropriated this year for road construction in Virginia. The Federal Aid for this state is $5,400,000, of which $1,500,000 is available this year. The roads to be built include bituminous, concrete, brick, asphalt penetration and surface treatment, macadam, gravel and soil.

West Virginia

This state has $2,700,000 available for highway construction this year. Of this amount $1,800,000 is Federal Aid and the remaining $900,000 state funds. According to C. P. Fortney, Chairman of the State Road Commission, this money is to be utilized in building 200 miles of graded earth road, 22 miles of bituminous macadam, 52 miles of concrete, 6 miles of water bound macadam, 12 miles of Asphaltic cement and 5 miles of brick.

Wisconsin

The funds available for 1919 in Wisconsin aggregate $11,000,000. These include $3,800,000 joint state, county and municipal funds; $3,200,000, Federal Aid joint United States Government, state and county aid; $1,500,000, county work, and $2,500,000 for maintenance of the state trunk system.

Concrete pavement is being used on the most travelled roads and gravel on those not getting so much hard usage. A great deal of grading is being done.

Wyoming

In Wyoming there is a state fund of $3,400,000 available for construction and maintenance of roads in 1919 and 1920. Federal Aid to be had is $2,800,000.

About 90 per cent. of the roads will be surfaced with shale or gravel, about 2 per cent. with concrete and the remainder with miscellaneous materials.

National Highway System Necessary to Make Rural Postal Operations Efficient

Improvement of Roadways of Country Would Save Cost of Construction in Brief Time, Says Blakeslee

That a national highway system is of first importance if rural postal operations are to be made efficient, is the statement made by Fourth Assistant Postmaster General Blakeslee.

During the year 1918, the rural delivery service of the post office department collected and delivered an estimated number of 3,870,068,064 pieces of mail. In the performance of this service 43,236 rural routes were utilized and an average of 1,121,753 miles of travel over highways was accomplished each day, or a total of 344,378,324 miles for the 307 working days of the year, on the basis of figures supplied by Mr. Blakeslee's office.

The direct cost of this transportation, government officials place at about $65,800,000, while the gross postage revenues derived amounted to about $48,962,950. When overhead costs, such as clerking, supervision, etc., are taken into account the probable expense is rated at $70,000,000.

On this basis there would appear to be a deficit annually of $20,000,000 but since in the handling of this mail, the rural delivery service is only one factor, the railways, urban delivery and other phases of the service entering into the operation, it is obvious that only a small part of the gross revenue can be attributed to this branch.

Hence the conclusion is arrived at that during 1918 the deficit in the rural delivery service could not have been less than $50,000,000.

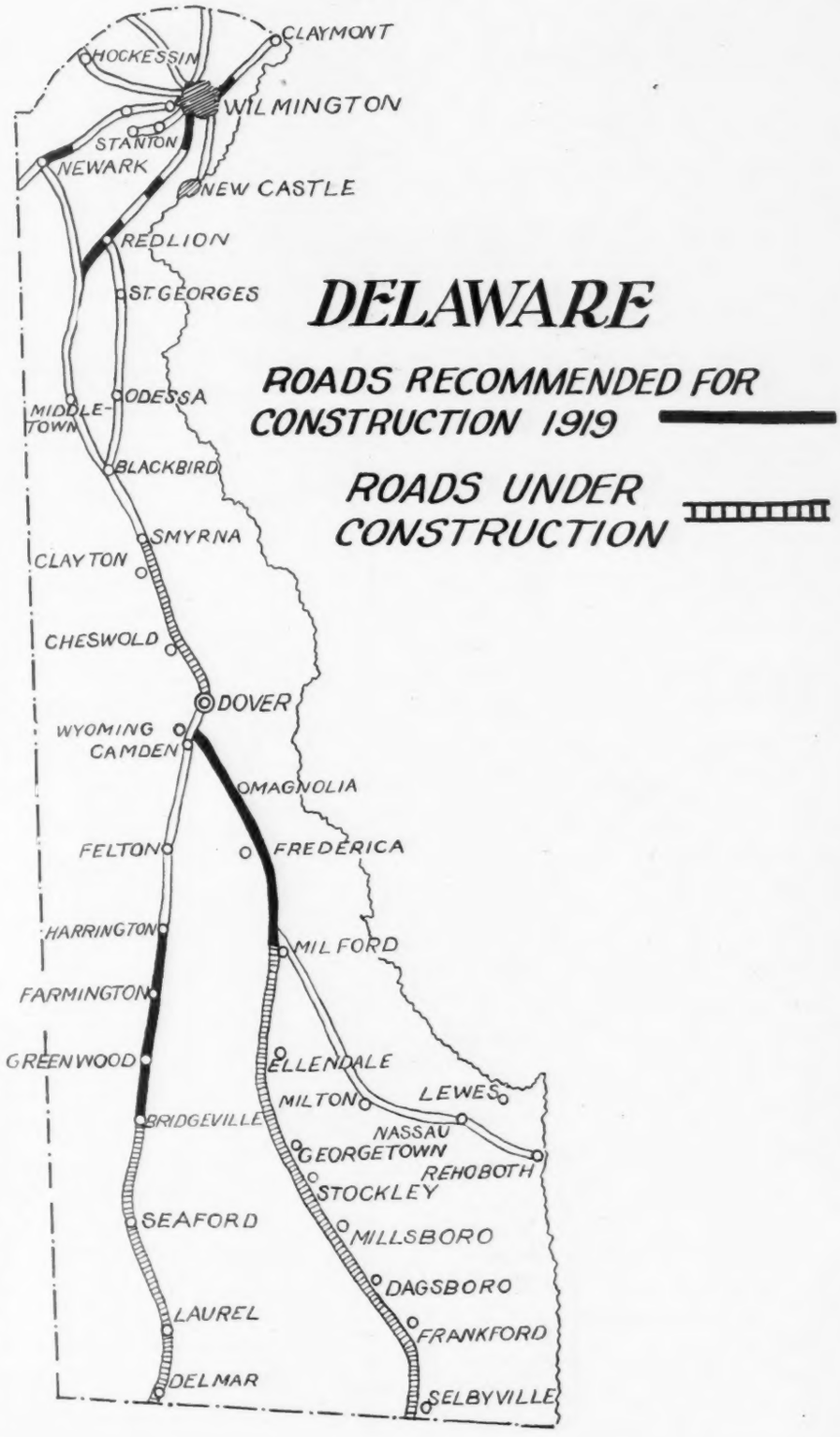
The vital importance of the service both from the standpoint of material benefits accruing to farmers and business men generally, aside from the spiritual value resulting to the nation in free communication of ideas, makes any relinquishment of the service unthinkable.

The only course left is to consider ways and means of cutting down the deficit and after a thorough survey, the officials of the department have come to the conclusion that a means can be had to this end, in the improvement and maintenance of at least 1,000,000 miles of highways of the United States.

Without going too greatly into detail the survey showed that little reduction in operating costs could be made in the first, second and third class divisions.

When the fourth class was reached, however, it was shown that the average number af parcel post packages delivered each day per route, is but 6.09 pieces while the average collection is but 1.22 pieces. Obviously any increase of the collection would amount to very little increase in expense and in fact the same statement may be made of the delivery.

In the last analysis it was shown that if the amount of matter transported daily by each route could be increased from 4 pounds to 1,800 pounds, not only would the deficit of the service be entirely wiped out but in addition the transportation of some 80,000 tons of foodstuffs daily in this fashion would serve to meet the consumers' needs while developing farm markets in far more adequate manner than at present.



In each conclusion, however, postoffice officials have clearly demonstrated these facts:

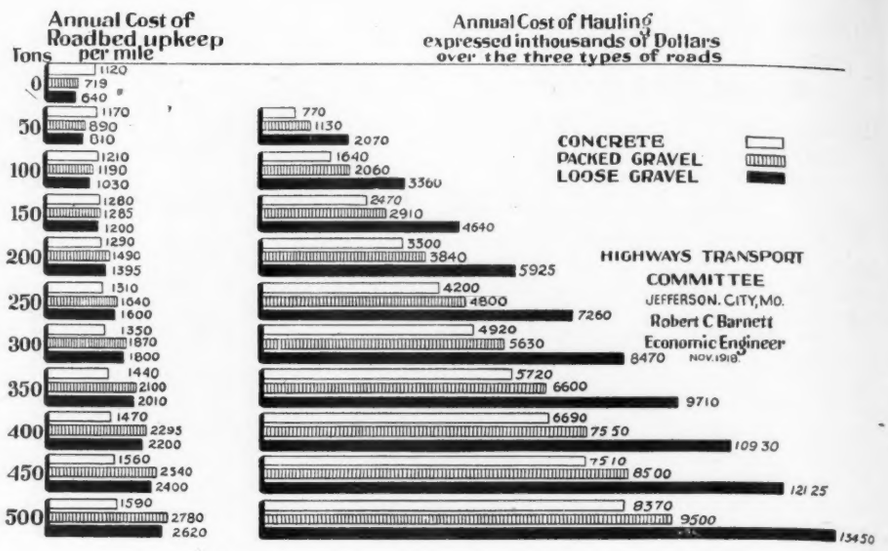
1. Avenues of communication, in this case the highways, must be adequate not only to take care of an increased traffic but to do it 365 days in the year, an impossibility on all but one-fourth of one per cent. of the highways of the country today.

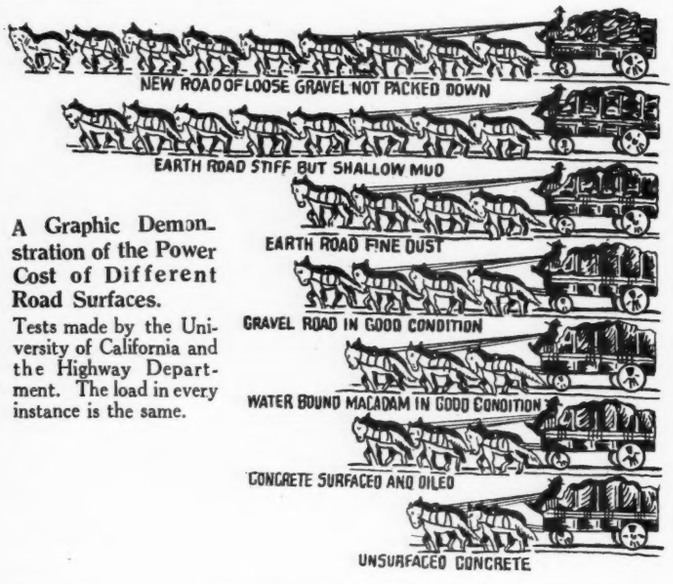
2. Adequate avenues of communication will serve to (a) increase food production since they will insure a wider marketing sphere and transportation at all times of the year. (b) They will bring about a definitely lowered cost of foodstuffs without affecting the farmer adversely, since a large percentage of costs go for excessive cost of transpor-

tation. (c) Any increase in their number will enhance the profitable commercial relations between all patrons. (d) The increased market to the farmer directly stimulates industrial activity. (e) Efficient use of the highways increases the ability of railways and waterways to convey matter profitably through the elimination of expensive delays and costly congestion at terminal.

Finally the taxpayer would be relieved of a burdensome deficit in postoffice operations and at the same time in his private capacity would be gaining the advantages already enumerated, together with improved real estate values, sociological factors and other benefits which statistics show, follow in the wake of good roads.

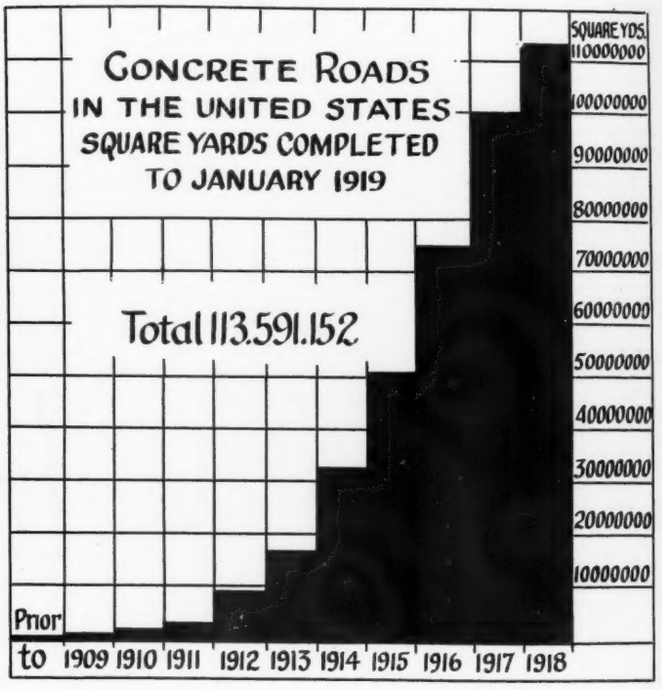
In order to bring about this desirable condition, post office officials estimate that at least 1,000,000 miles of highways should be brought to standard. The saving in postal operations alone, it is pointed out, would pay the cost of $5,000,000,000 worth of road improvement without taking into account any of the other factors mentioned.





A Graphic Demonstration of the Power Cost of Different Road Surfaces.

Tests made by the University of California and the Highway Department. The load in every instance is the same.

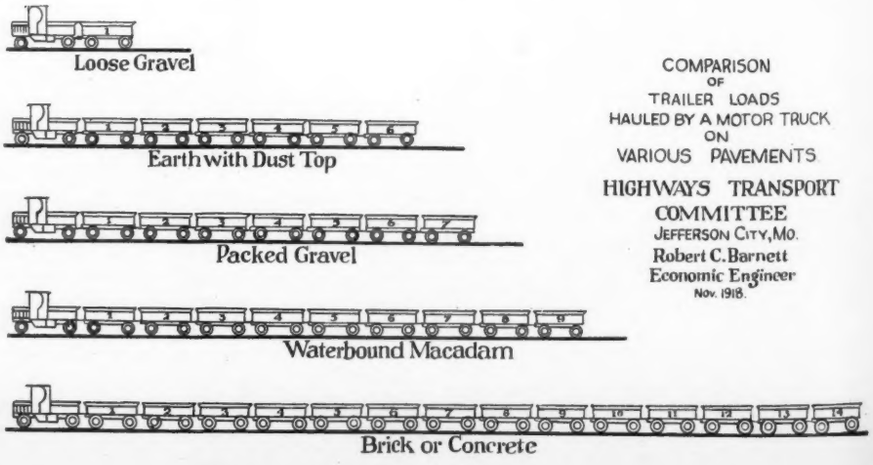


Florida Legislature Passes Several Good Road Measures

All good roads measures introduced by the joint special committee were passed at the extra session of the Florida Legislature recently concluded. This includes the measure abolishing the convict lease system, creating a road force, care and maintenance of road forces and a two-mill tax to meet federal aid.

Arkansas highway officials estimate that at least $25,000,000 will be expended in hard surfaced road construction in their state in the next five years.

The Nevada State Automobile Association has been organized in Reno. One of its main purposes will be to undertake a vigorous road building campaign.



Good Roads Will be Demanded by Soldiers When They Return Home*

American Forces Have Learned Value of Good Highways Which Helped Win War

IF we adopt the same attitude in overcoming the problems of peace, that we did in solving those raised by the war, there can be doubt as to the role our country shall fill in the immediate future.

The urgent need for "Good Roads" constitutes one of the greatest problems of our country. We need permanent roads, roads than can be used twelve months in each year. This need has been only too apparent to most of us in the past, but in spite of the need and in spite of the enthusiasm on the part of many, the opposition of others has in the past acted as a check to getting anything done. If these obstructions had died on the field of honor they would have died in vain. There isn't a greater crime in the United States and never will be. If the fly by night politicians had been with our armies in France during the past eighteen months and seen the wonderful roads of France, Belgium, Luxemburg, Italy and Germany, they would have a better understanding of what good roads mean to a country. If they had seen the miles and miles of traffic moving over the network of near perfect roads behind our always advancing doughboys, a realization would come of what good roads mean to a country.

In no small measure the success of the Allies is due to the great arteries of travel which the foresighted French nation had constructed in times of peace. Subjected to a constant stream of heavy traffic for over four years, such as is largely beyond the imagination of those who have not seen for themselves, these roads stood the test summer and winter, spring and fall, and made possible those victories which resulted in driving the Hun back across the Rhine. Whether those who are opposed to the construction of good roads are purposely blind to all these facts is not known. In a true sense they are obstructionists. They are a drawback to any community. They are uncivilized. America, because of our government, permits these creatures to hibernate and live among us.

The Joint Committee of Federal Aid in the construction of post roads, Sixty-third Congress, failed to realize its purpose and showed a lack of definite information, particularly as to the amount of tonnage hauled over the public roads.

The Department of Commerce has collected an enormous amount of data regarding the total crop production of America but did not report the amount hauled over dirt roads by wagons or automobile trucks.

The Interstate Commerce Commission has gathered statistics regarding the amount of freight hauled over the railroads of America with a view of solving the problem of transportation, yet it did not offer any solution of the problems of transportation involved in carrying these products to the railroad. Up to the present time all have failed to get the vital facts necessary to accomplish the end desired in road construction and to successfully apply the money appropriated for the Federal aid of road construction, and many states have not enacted proper laws or have failed to institute the proper highway commission and appropriate money which is necessary to receive the Federal aid.

The Interstate Commerce Commission has gathered statistics regarding the quated. They are not designed to carry the heavy traffic now. What will become of them in the future? There are over 2,750,000 miles of highways in the United States. Of this amount, less than 275,000 miles have any form of surfacing whatsoever. The reports by the Department of Agriculture indicate that the increase in mileage is about 50,000 miles per annum, that is new roads, while about 15,000 miles are being improved per annum. Therefore, the mileage of new roads is three times greater than the amount surfaced yearly.

It is a vital problem, this question of roads, one that reaches down into the very foundation of our social and economic scheme of life.

A national investigation into highways transportation by a Federal Highway Commission will provide this basis; increased road funds will give us the motive power.

Roads are the clearing houses for the various states and the only means of free travel and much unlike the railways, there is at present little competition or choice of routes. There should be alternative routes between the same terminal points. This competition can never be wasteful because each will serve different districts en route; but this entire system must have a centralized head and a small body of men who are directly responsible for the construction and maintenance of highways in each state. Permanent, all the year around highways may be called the normal relation of the modern state to industry.

We are now faced again with a problem of our national prosperity, education and social intercourse, and the immediate future demands that this problem be overcome, and it can only be done by honest legislators, making honest laws, placed in the hands of men who have passed the test, by service in the construction and maintenance of highways. Good roads mean extended prosperity for America.

(* Extracts from article taken from the Amaroc News, official organ of the American Expeditionary Forces printed at Coblenz, Germany. The man who sent it, Lieut. Theo. E. Damm, manager of the News, writes that the American soldiers abroad are going to be vitally interested in seeing the National Highway System worked out in this country.)

What the States Will Spend on Roads This Year

According to figures collected by the B. F. Goodrich Rubber Co., combined forces of the Federal Government, states and counties will spend $350,000,000 in new construction and maintenance of the nation's network of highways. The amounts to be spent in each state follow:

Alabama	$1,000,000
Arizona	6,250,000
Arkansas	4,297,398
California	20,000,000
Colorado	4,742,000
Connecticut	8,000,000
Delaware	8,528,000
Florida	8,000,000
Georgia	7,911,000
Idaho	2,100,000
Illinois	6,013,304
Indiana	12,000,000
Iowa	20,498,534
Kansas	8,000,000
Kentucky	3,500,000
Louisiana	2,000,000
Maine	1,630,000
Maryland	6,750,000
Massachusetts	6,000,000
Michigan	15,000,000
Minnesota	11,127,986
Mississippi	7,000,000
Missouri	5,413,079
Montana	6,300,000
Nebraska	2,005,000
Nevada	1,377,499
New Hampshire	1,630,000
New Jersey	6,500,000
New Mexico	4,000,000
New York	2,000,000
North Carolina	5,000,000
North Dakota	1,082,000
Ohio	13,321,500
Oklahoma	3,600,000
Oregon	8,000,000
Pennsylvania	8,780,000
Rhode Island	1,470,000
South Carolina	7,000,000
South Dakota	6,767,276
Tennessee	3,650,996
Texas	60,480,000
Utah	10,092,794
Vermont	1,797,650
Virginia	3,400,000
Washington	6,500,000
West Virginia	2,000,000
Wisconsin	3,200,000
Wyoming	6,500,000
	$352,216,016

Concreting the White Horse Pike From Philadelphia to Atlantic City

Trucks Being Used Extensively by Every Contractor

THE White Horse Pike to Atlantic City, N. J., is one of the best known tourist routes in the country. Starting at Camden, N. J., after a ferry trip from Philadelphia, Pa., one travels over a plainly marked route of 60 miles to Atlantic City.

The road is paved from Camden to Berlin, a distance of 15 miles, and from Absecon to Atlantic City, a distance of nine miles. The section from Berlin to Absecon is gravel.

Gravel was thought to be an ideal road material, but it does not stand up well under the very heavy traffic encountered on this road and in dry weather it is very dusty.

The road is now under reconstruction from Berlin to Egg Harbor, 25 miles toward Atlantic City. It is listed as Route 3 on the State Highway system of improved roads.

In common with the other roads in the State Highway system the paving will be of concrete 18 ft. wide with a shoulder of gravel or macadam on each width 24 ft. The concrete is 6 in. thick at the edges and 8¾ in. thick in the middle.

This new road will cost approximately $40,000 per mile. The concrete is laid in 50 ft. blocks with expansion joints between blocks. Each block requires about 150 bags of cement, 11¼ cu. yds. sand, 16¾ cu. yds. stone or pebbles. Mixer outfits are laying from 150 to 300 ft. per day. Figured as work for trucks this means that from 25 to 50 truck loads of material must be delivered to each outfit every working day.

From Berlin the new road follows the old route as far as Atco. Here the road branches off, avoiding an overhead bridge over the Pennsylvania R. R. tracks. This bridge with its two sharp turns at the top has been the cause of several serious accidents. At Atco the route cuts across the edge of a lake and goes through farm land. The old road is met again at the bridge, crossing the Pennsylvania Railroad tracks at Ancora. The old road is then followed to Bellevue Ave. in Hammonton. Instead of going through the town, making a right and left turn, the road goes straight on, crosses the foot of the Hammonton lake and comes out on the pike again at Da Costa. From this point to Egg Harbor the road is straight.



Part of the Completed Road
Quite a difference from the road below

Work will be started later on the section from Egg Harbor to Absecon which, when finished, will complete the paving from Camden to Atlantic City. Five contractors are working on the road at present.

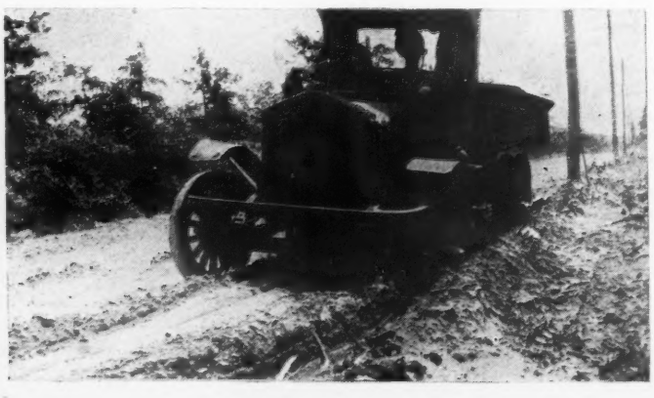
On account of the sandy soil great trouble was found in operating the trucks in cuts. This trouble has been overcome by the use of movable "duck-boards." The trucks are turned around at the start of a cut and backed over the duck-boards, dumping the load at the side as required. These boards save a lot of time, as they prevent the trucks from sinking in and being stuck and they allow the trucks to pull full loads. One hundred bags of cement (94 lb. each) is the regular load for a 5-ton truck.

Some contractors are also using gasoline "dinkey" engines in this work and they are moving these engines from one place to another on trucks. The track is laid up an incline right into the body of the truck and the engines run into them.

John M. Kelly Construction Co., of Camden, N. J., have contracts for two sections, one from Da Costa to Elwood, 3.87 miles, and the other from Elwood to Egg Harbor, 5.87 miles.

This section follows the old road and is perfectly straight for the entire distance. The grading is being done by an excavator and teams. Both grading and concrete work are being done at the same time on this section.

The material for the concrete is hauled in two Saurer and two Pierce-Arrow 5-ton trucks, all equipped with dump



Bad Going. Part of the White Horse Pike Torn Up by Heavy Truck Travel



Mixer on Wilhelm & Sons Section
Five five-ton trucks are hauling material for this outfit



Mixer of John M. Kelly Construction Company. Four Five-ton Trucks Haul Material for This Outfit



Movable "Duck-Boards" Used on Soft Sand. A Pierce Truck is Dumping a Load of Sand

bodies. The material is received at a siding at Amatol Arsenal (a large shell loading plant built during the war for the United States Government) and is unloaded by a hoisting engine and bucket into an overhead bin, from which it is chuted into the trucks.

The road over which the trucks travel is very poor, being full of ruts and holes. But in spite of this handicap the trucks are doing the work very successfully.

A significant fact in connection with this work is that a majority of the trucks are hired by the road contractors from hauling contractors. Their use for the long hauls in grading and, for almost all of the hauling of material for the concrete, is in direct competition with horses. The trucks do their work so much faster than horses that there is no comparison between the two.

The new paving is responsible for an increased interest in the rural truck express plan. Both Philadelphia and Atlantic City markets draw extensively on the farming section in New Jersey for supplies. Farmers are no longer willing to spend all night driving their teams to market and back.

Dealers, well informed as to farmers' needs, expect many sales when the road is finished. They are already going after the business.

Motor Truck Rates Fixed by Nebraska Commission

Transportation Classified in Eastern End of State and Schedule Drawn; Poor Roads Force Penalties

AN interesting experiment which may disclose significant facts in the operation of motor transportation lines has been undertaken in eastern Nebraska by the Nebraska State Railway Commission. Acting under authority vested in them, the commission has placed truck operation on a road basis making classifications for various types of goods carried almost identical with the classifications maintained by the western railways.

The rates provide for a motor truck schedule within a radius of 60 miles. Four classifications are provided for in these rates between points not within the same city or village in eastern Nebraska. The minimum charge for first class commodities is 15 cents per 100 lb. in addition to which a charge of 1½ cents is made for each mile—second class rates are 85 per cent. on this figure—third class rates are 70 per cent. and fourth class 60 per cent. Minimum charge is 50 cents.

One of the first difficulties which the commission had in its plans for classifying transportation of this character was in ascertaining the cost of truck service over dirt highways with that degree of definiteness obtainable in railroad transportation.

Initial classifications were arrived at by taking the operating costs of truck drivers and working from them to a rate which would give a reasonable profit.

The experiment was particularly interesting in view of the fact that it now seems probable that the National Highway System will be constructed which will afford a uniform road bed for interstate traffic of the same character as that now undertaken on purely local routes. It is interesting to note that the Douglas County Highway Transportation Committee of Nebraska instigated the action by the State Commission.

Intital operating costs estimated on a basis of one truck to the load of 4000 lb. driven 50 miles per day were as follows:

	Costs per ton-mile
Operating:	
Gas and oil	2.5
Chauffeur's wages	7.2
Maintenance:	
Running repairs	2.5
Depreciation	4.16
Repair of tires, etc.	1.87
General:	
Salaries, rent, etc.	3.00
Insurance	0.5
Loss and damage	0.8
Taxes	0.027
Return on investment	2.5
Total	25.057

The rate for gas is fixed at 25 cents a gal. and oil at 75 cents a gal. Operator's wages are based on an estimate of $24 a week and $2 a day expense allowance. Depreciation was fixed on a scale of 3600 miles for the average truck. Tires were given an average life of 7500 miles. Taxes were based on an actual value of $1200 per ton for the first year of the truck's life, $800 per ton the second year and $400 per ton the third year. Returns were figured at the rate of 20 per cent. on the investment.

Despite a vigorous protest from the good-road men of Missouri, Governor Gardner signed the dirt road bill which provides for a system of 6,000 miles of graded highways. Each county in the State is allowed $1,200 a mile provided that the total graded is not less than 50 miles. There is some doubt as to whether Federal aid will be possible under this statute, as the law limits Federal appropriations to roads of a substantial character.

Federal-aid funds for road building in Florida will be used in the future only on roads constructed of standard types of surface, according to an announcement by State Highway Commissioner Cocke.

Governor Davis of Virginia has named a road construction board of prominent citizens to advise in the adoption of a good-roads program for Virginia. A highway bond issue of $40,000,000 is recommended by the executive.

Ultimately Kansas Expects to Have Over Ten Thousand Miles of Hard-Surfaced Roads

THE largest and most important factor before the State of Kansas at this time is hard roads—all-year-'round roads. It is the most logical step in the industrial development of this State at this time, and it is certainly getting busy.

Kansas is a surprise to the whole country in her rapid development, growth and progress in the automobile industry, but she has fallen down sadly on good roads building. This, of course, is contrary to motor vehicle transportation. This State is already beginning to see and feel the absolute necessity of better roads and wider roads and more of them, in order to accommodate the congested conditions confronting it.

There is no definite number of miles of highways authorized for building in the early future. There is a tremendous activity over the entire state, and roads are being petitioned for and contracted for all over the state just as rapidly as the papers can be prepared.

There was no appropriation made by the State Legislature in session last winter for road construction in Kansas. The State of Kansas has never been able to engage in road building. There is a Constitutional restriction preventing it.

However, the Legislature did vote to place before the people of the state, the following amendment to our State Constitution, which you will note authorizes the state to engage in road building, providing the amendment passes at the general election to be held in November, 1920:

GOOD ROADS AMENDMENT TO THE CONSTITUTION OF THE STATE OF KANSAS

Section 1. That the following proposition to amend the constitution of the State of Kansas is hereby submitted to the qualified electors of the state for their approval or rejection.

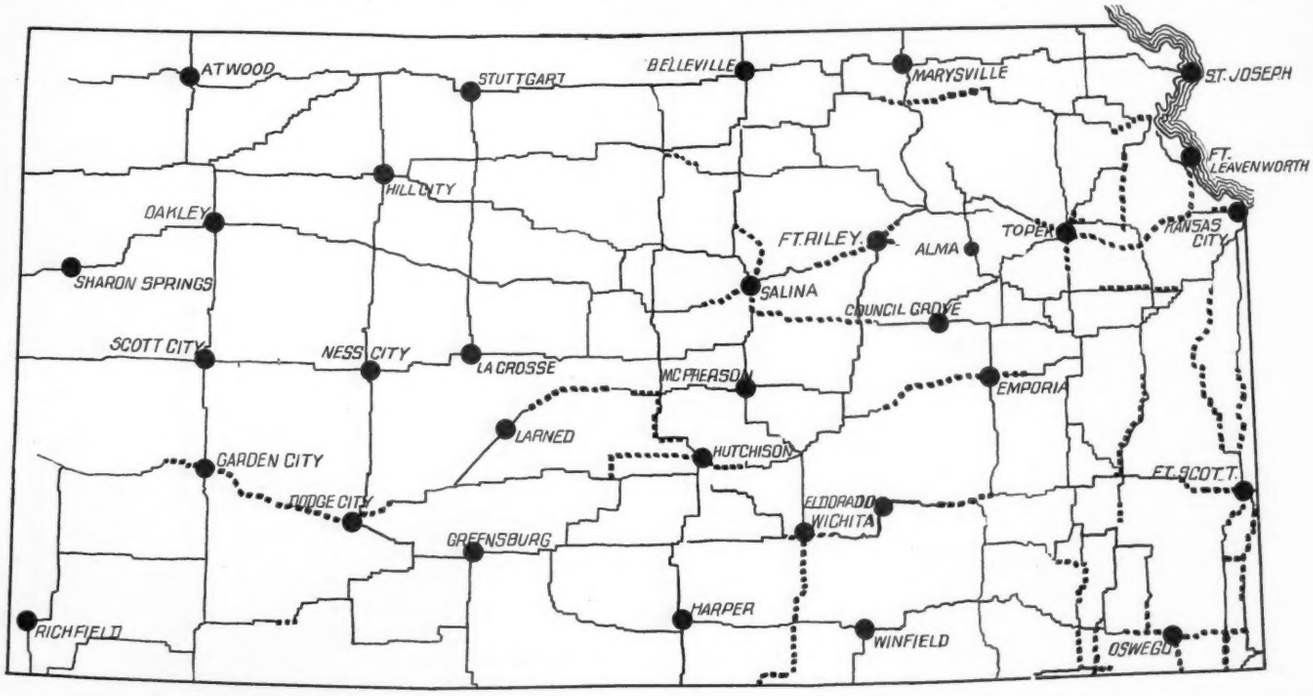
Sec. 2. The state shall never be a party in carrying on any works of internal improvement except to aid in the construction of roads and highways and the reimbursement for the cost of permanent improvements of roads and highways, constructed after March 1, 1919; but such aid and reimbursement shall not be granted in any county for more than 25 per cent. of the cost of such road or highway, nor for more than ten thousand dollars per mile, nor for more than one hundred miles in any one county; except, that in counties having an assessed valuation of more than one hundred million dollars such aid and reimbursement may be granted for not more than one hundred and fifty miles of road or highway. And the restrictions and limitations in the constitution, relating to debts and internal improvements, shall not be construed to limit the authority retained or conferred by this amendment.

The Federal Government has made available for use in Kansas the sum of $7,896,692.32 which is to be used in road construction and improvement during the two years ending June 30, 1921. This amount, of course, is distributed through the various counties in the state, by direction of the Kansas Highway Commission. And the amount, of course, is inadequate for the construction and improvement desired. A good share of it is exhausted now. There is an enormous amount of enthusiasm just at this time, —everybody trying to see how much more he can do than the other fellow. The Kansas Highway Commission is authorizing 50 per cent. Federal Aid on road construction, including all culverts, bridges, cuts, fills, etc. But the counties are required to equal that amount with an additional 50 per cent., which is to be paid by the county, township or townships through which the improved road extends, and a benefit district created alongside the road to be constructed. Thus the state pays nothing toward the construction of the roads.

Kansas stands second, with Texas first, in the nation in the number of miles of highways. Of 105 counties in Kansas, 32 have actually begun their surveys and are drawing plans and specifications or already have contracts let or roads built. There are, of course, other counties following in rapid succession, and will continue to do so until all of the main roads of the State will be hard-surfaced.

Kansas roads are being built with the greatest of precaution and the best of materials. For that reason it is going to be slow starting, but within the next year or 18 months one should be able to go almost to any important city, or over the most important thoroughfares in the State, on hard-surfaced roads any day in the year. These roads are being built of first-class materials and by first-class methods under the ablest inspection and supervision.

The principal types of roads being built in Kansas are narrowed down to three: Brick, concrete and bituminous



KANSAS
ROADS UNDER CONTRACT ----
ROADS TO BE IMPROVED ——

materials. Bituminous materials are becoming very popular for communities desiring a good type of road and yet not too expensive.

Kansas now has practically 212,000 motor vehicles. The annual increase in motor cars and trucks in this state has been many thousands each year for the past several years, but, with the present trend toward road building, the increase from this time on will be many times over what it has in previous years. These 212,000 automobiles and motor trucks in Kansas cannot be operated economically and efficiently over anything but 365-day roads.

The people, both in the city and country, have concluded that the motor truck and automobile are the one necessity in order to properly accomplish their duties and bring about the necessary welfare, commercial and business relationships among themselves.



Showing Construction of Brick Road in Geary County, Kansas
(Photo was taken early in July)



Showing Section of Concrete-Tarvia Road in Shawnee County

Good Roads Will Furnish Basis for Bigger Bank

How a good road bond issue was advocated and carried through in order to lay the foundation for a bigger bank is a Louisiana novelty described by J. L. Westbrook, cashier of the Bank of Denham Springs and president of the Livingston Parish Bank at Doyle.

Livingston is the last of the cheap-land areas in that entire section, said Mr. Westbrook. The land, he added, was held back by the same cause as the banks, the lack of roads interfering with accessibility. There are groups of strawberry ranches and other spots where money is plentiful, but it never gets near the banks. Good roads will make it available. So the highway cause was boosted, the elections won, and the bonds will be issued and the roads built without delay.

The main line will lead through the parish, with laterals circling in every direction. The principal thoroughfare will connect with the New Orleans Highway at Hammond and with the Jefferson Highway at Baton Rouge, putting the entire parish in the touring belt, which will hasten development. A city will grow up at the parish center, and the bank he and others are planning will be situated there. The unique feature of the idea is the plan to employ the good roads to gather deposits. It is proposed to run automobiles to all the communities and farms and to receive savings at the homes instead of compelling the farmers to come to the bank. The official collectors will transact other business for the farmers at the same time, establishing a co-operation which will be valuable to both.

Mr. Westbrook declares that all the capital will be forthcoming before the roads are completed.

A $40,000,000 Highway Bond Issue was passed by a seven to one vote by the people of California recently. Another $10,000,000 will be spent by the counties of the State in this manner and $10,000,000 of Federal aid will be expended on certain post roads. This makes a total of more than $60,000,000 which will be expended in California on the betterment of highways in the next three years. In the event of the passage of the Townsend measure, creating a national highway system, California will receive an increased mileage over and above that mentioned.

Effect of Motor Truck Impact on Roads

WASHINGTON, July 25.—Preliminary road impact tests made by the Bureau of Public Roads indicate that the impact pressure exerted by a motor truck in motion is about six times that of a truck at rest. The tests were conducted with a Class B Government Truck loaded up to five tons, running up to 15 miles an hour and allowed to fall from varying heights on the impact measuring apparatus. Tests will be continued with trucks ranging from the lightest to the heaviest until complete data is obtained.

The question of the relative impact exerted by trucks with solid versus giant pneumatic tires will also be investigated. Definite arrangements have been made to secure a Packard three-ton truck with requisite tire equipment for these tests and a loan of other units would be welcomed by the Government officials.

Tests to show the resistance of various types of road surface such as concrete, asphalt, etc., are soon to be undertaken. About 50 road slabs built of these materials will be broken under the impact of a machine which approximates impact effect delivered by motor trucks.

By measuring the amount of impact actually delivered by the motor trucks to roads and by proceeding further in testing the destruction of actual road slabs subjected to impact, Government officials hope to obtain very definite information which will permit them to design a high type or types of pavement that will resist definite traffic conditions.

Gov. Henry J. Allen, of Kansas, who is Chairman of the State Highway Commission, recently informed the Atchison Board of County Commissioners that no federal aid would be allowed for grading and bridges and culverts on state highways unless accompanied by a petition for a hard surfaced road.

It is estimated that $156,000 000 will be expended in road construction in Texas in the next three years.

County Bond Issues Proposed and Carried in Some of the States

	Proposed	Carried
Arizona		
Cochise	1,000,000	.....
Greenlee	.....	200,000
Maricopa	.....	4,000,000
Pina	500,000	.....
California		
Fresno	.....	4,800,000
Imperial	1,500,000	.....
Merced	.....	1,250,000
San Diego	2,000,000	.....
Sonoma	.....	1,640,000
Delaware		
Sussex	.....	500,000
Florida		
Polk	390,000	.....
Georgia		
Baldwin	100,000	.....
Banks	.....	75,000
Barrow	100,000	.....
Bartow	400,000	.....
Ben Hill	175,000	.....
Berrein	.....	500,000
Bibb	.....	700,000
Brooks	500,000	.....
Bulloch	400,000	.....
Chatham	2,400,000	.....
Charlton	.....	75,000
Clarke	250,000	.....
Colquitt	.....	500,000
Coweta	.....	48,000
Dooly	400,000	.....
Dougherty	.....	400,000
Evans	.....	40,000
Floyd	960,000	.....
Glynn	.....	350,000
Grady	250,000	.....
Hall	.....	600,000
Hart	200,000	.....
Henry	200,000	.....
Jackson	.....	100,000
Laurens	.....	500,000
Lowndes	.....	500,000
Lumpkin	.....	75,000
Mitchell	.....	400,000
Morgan	.....	325,000
Murray	148,000	.....
Muscogee	740,000	.....
Pulaski	.....	200,000
Richmond	700,000	.....
Spaulding	.....	350,000
Sumter	.....	500,000
Terrell	150,000	.....
Thomas	500,000	.....
Tift	.....	300,000
Troupe	.....	500,000
Union	60,000	.....
Walton	.....	200,000
Ware	.....	100,000
Wilkes	300,000	.....
Worth	400,000	.....
Idaho		
Bingham	.....	600,000
Blaine	100,000	.....
Butte	.....	60,000
Caribou	100,000	.....
Filer	360,000	.....
Fremont	400,000	.....
Gem	200,000	.....
Idaho	.....	90,000
Jefferson	.....	200,000
Jerome	200,000	.....
Madison	125,000	.....
Minidoka	.....	200,000
Oneida	250,000	.....
Rupert Highw. Dist	195,000	.....
Twin Falls	.....	125,000
Illinois		
Grundy	.....	715,845
Iroquois	600,000	133,000
Lake	.....	40,000
Ogle	.....	60,000
Whiteside	.....	25,000
Will	.....	22,000
Indiana		
Marion	.....	1,000,000
Iowa		
Blackhawk	.....	1,500,000
Polk	2,000,000	.....
Scott	.....	2,000,000
Woodbury	2,750,000	.....
Louisiana		
Beauregard	.....	150,000
Caldwell	400,000	.....
Cameron	390,000	.....
Catahoula	500,000	.....
Claiborne	250,000	.....
Franklin	.....	750,000
Jackson	.....	500,000
Jefferson	.....	150,000
Jefferson Davis (being sold)	.....	150,000
Rapides	2,000,000	.....
St. Mary	650,000	.....
Terrebone	105,000	.....

	Proposed	Carried
Michigan		
Jackson	.....	1,400,000
Minnesota		
St. Louis	7,500,000	.....
Mississippi		
Forest	30,000	.....
Franklin	.....	400,000
Pike	3,000,000	.....
Sharkey	.....	200,000
Tellahatchie	.....	100,000
Tate	.....	300,000
Washington	.....	1,500,000
(Appropriation)	.....	2,000,000
Missouri		
Buchanan	.....	2,000,000
Clay	.....	300,000
Cooper	100,000	.....
Daviess	100,000	.....
Gentry	.....	100,000
Greene	2,000,000	.....
Lawrence	.....	36,000
Pettis	500,000	.....
Polk	25,000	.....
Saline	.....	68,000
Montana		
Gallatin	.....	400,000
Park	150,000	.....
Silverbrow	250,000	.....
Nebraska		
Douglas	3,000,000	.....
New Jersey		
Essex	605,000	.....
North Carolina (annual)	.....	1,000,000
(Increased revenue from automobiles)	.....	1,250,000
Beaufort	.....	1,000,000
Burke	.....	80,000
Catawba	500,000	.....
Forsyth	100,000	.....
Lemoir	.....	2,000,000
Martin	1,000,000	.....
Mecklenburg	1,000,000	.....
Oklahoma		
Pushmataha	.....	29,000
Pushmataha	.....	129,000
Washington	60,000	.....
Oregon		
Baker	.....	500,000
Benton	200,000	.....
Curry	.....	90,000
Deschutes	.....	125,000
Gilliam	260,000	.....
Grant	.....	90,000
Harney	.....	160,000
Jefferson	.....	100,000
Klamath	.....	50,000
Lake	.....	200,000
Lincoln	.....	180,000
Linn	.....	100,000
Malheur	.....	200,000
Marion	.....	850,000
Morrow	.....	290,000
Polk	.....	320,000
Sherman	.....	300,000
Tillamook	.....	420,000
Umatilla	.....	1,050,000
Wallowa	.....	500,000
Wheeler	44,000	.....
Yamhill	.....	360,000
Pennsylvania		
Armstrong	.....	1,000,000
Beaver	125,000	.....
Cambria	1,000,000	.....
Chester	1,000,000	.....
Clarion	.....	500,000
Clearfield	1,500,000	.....
Erie	.....	1,300,000
Jefferson	.....	900,000
Lawrence	500,000	.....
McKean	.....	750,000
Mercer	1,500,000	.....
Schuylkill	.....	350,000
Somerset	1,000,000	.....
Tioga	500,000	.....
Warren	.....	750,000
Washington	1,000,000	.....
York	2,500,000	.....
South Carolina		
Anderson	.....	1,450,000
Richland	2,000,000	.....
Union	.....	1,175,000
York	60,000	.....
South Dakota		
Minnehaha	2,500,000	.....
Yankton	2,000,000	.....
Texas		
Austin	750,000	.....
Bastrop	.....	310,000
Bee	600,000	.....
Bexar	1,500,000	.....
Brazos	1,500,000	.....
Cameron	.....	300,000

	Proposed	Carried
Camp	450,000	.....
Chambers	.....	50,000
Collin	.....	3,600,000
Cooke	1,500,000	.....
Dallas	.....	6,500,000
Delta	.....	1,000,000
Denton	.....	1,625,000
Eastland	1,000,000	130,000
Ellis	1,000,000	.....
Fannin	.....	180,000
Franklin	.....	500,000
Grayson	3,500,000	.....
Harrison	.....	1,750,000
Hayes	400,000	.....
Hampill	200,000	.....
Hill	.....	1,500,000
Hunt	.....	2,000,000
Johnson	.....	2,000,000
Karnes	1,000,000	.....
Kaufman	.....	1,450,000
Kendall	.....	50,000
Kleberg	.....	350,000
Lamar	.....	1,500,000
Lamb	.....	50,000
Limestone	.....	375,000
Morris	.....	50,000
Nacogdoches	.....	800,000
Navarro	5,000,000	.....
Orange	.....	1,000,000
Panola	.....	135,000
Parker	.....	800,000
Polk	800,000	.....
Rains	250,000	.....
Red River	.....	175,000
Rockwall	.....	800,000
Rusk	.....	500,000
San Augustine	.....	250,000
Shelby	.....	350,000
Smith	.....	1,500,000
Sutton	300,000	.....
Tarrant	2,800,000	.....
Titus	.....	1,000,000
Tom Green	.....	500,000
Tyler	.....	800,000
Upshur	1,000,000	.....
Washington	1,500,000	.....
Webb	300,000	.....
Wharton	2,000,000	.....
Wichita (2,500,000 available)	.....	1,500,000
Wilbarger	750,000	.....
Williamson	1,500,000	.....
Wise	.....	30,000
Wood	.....	1,250,000
Utah		
Salt Lake	.....	1,500,000
Utah	850,000	.....
Virginia		
Campbell	114,000	.....
Washington		
Chelan	1,600,000	.....
Grays Harbor	.....	400,000
(Available)	.....	1,640,000
Mason	.....	250,000
Pierce	.....	2,500,000
Spokane	3,500,000	.....
Walla Walla	1,600,000	.....
Yakima	.....	500,000
West Virginia		
Doddridge	250,000	.....
Fayette	319,000	379,000
Kanawha	2,040,000	.....
Greenbrier	.....	126,000
Hancock	.....	100,000
Harrison	3,000,000	.....
Lewis	1,750,000	.....
Logan	1,000,000	.....
Marshall	600,000	.....
Mason	.....	128,000
Mineral	.....	137,000
Monongalia	475,000	300,000
Morgan	500,000	.....
Putnam	306,000	.....
Raleigh	287,000	.....
Roane	67,000	.....
Summers	42,700	30,500
Tyler	900,000	.....
Wayne	.....	1,000,000
Wetzel	105,000	.....
Wirt	250,000	.....
Wood	40,000	.....
Wyoming	140,000	.....
Wisconsin (available)	.....	10,210,000
Green	3,000,000	.....
Jefferson	2,000,000	.....
Outagamie	.....	452,000
Racine	2,350,000	.....
Rock	.....	1,500,000
Walworth	3,000,000	.....
Wood	1,500,000	.....
Wyoming	.....	2,800,000
Totals	114,982,700	102,022,845

National Motor Truck Development Tour is Making Good Progress on Long Trip

Seventeen Motor Trucks Leave Chicago on Start of Three-Thousand-Mile Journey and Are Received by Crowds Everywhere Enroute. Demonstrations Show Farmers That Motor Truck is Practical in His Everyday Work. Haul Grain, Stock and Farm Products. Plans for Future Spreading of Tour Lessons

By A. V. COMINGS

SPEEDING westward toward the setting sun, into the very heart of the great midwest farming section, seventeen motor trucks, sent on a development and demonstration tour by the National Association of Motor Truck Sales Managers, are now well along on the first leg of their 3000-mile journey that will end in Milwaukee October 4th. The caravan started from Chicago August 4th and to date has been rolling into the towns and cities along the route exactly as per schedule. Everywhere the trucks have been greeted by interested and inquisitive crowds made up principally of farmers and business men, and judging from the results already achieved the tour will be successful far beyond the most sanguine expectations of those who made it possible. The trucks making the tour are as follows:

Winther four wheel drive 1½ ton, Atterbury 2 ton, Bethlehem 1½ ton, Clydesdale 1½ ton, Diamond T 1½ ton, Gramm-Bernstein 2 ton, Master 1½ ton, Republic 2½ ton, Service 1½ ton, Selden 1½ ton, Signal 1 ton, Sterling 2½ ton, Atlas ¾ ton, Maxwell 1½ ton, Goodyear tire service, Sterling truck; Firestone tire service, Master truck; Standard Oil tank service, Diamond T truck.

In addition to these a Hawkeye truck will join the caravan at Des Moines, Ia., for the rest of the trip. All are equipped with pneumatic tires.

The convoy of trucks started from Grant Park, on Chicago's downtown lake front, at 10.30 a. m. August 4th. From early morning till the time of departure the park was a busy scene, as truck after truck arrived, took its place in the line-up, and final details were ironed out. A crowd of a thousand or more interested spectators were present and before leaving a short program of speaking was given, the speakers occupying the big express body of the Sterling truck entry as a rostrum.

The principal speaker was Col. Humphries, chief of staff to General Leonard Wood, who outlined briefly the importance of the truck in the world war, and prophesied great things for the truck in peace time work. He bade the caravan godspeed, with the best of luck, and assured those who are sponsoring it that the army would watch its progress with a great deal of interest.

A. R. Kroh, who will do much of the speaking on the trip, made a short address impressing upon those present the importance of the motor truck in rural communities and on the farm, and telling something of what the association hoped the trip would accomplish.

The addresses were short and little time was lost in starting after their conclusion.

The sailor band from the Great Lakes Naval Training Station, which will accompany the caravan on its entire journey, played several selections during the program and then the "gobs" scrambled into the Sterling and Service trucks and the parade started out of the park and into Chicago's busy loop district and then straight out Jackson Boulevard. The trucks were headed by a detail of Chicago motorcycle policemen, who cleared the streets ahead of them, and the epoch-making tour was under way in real earnest.

Elgin was the first scheduled stop and the caravan arrived there late in the



The "gob" band plays at Belvidere, Ill.



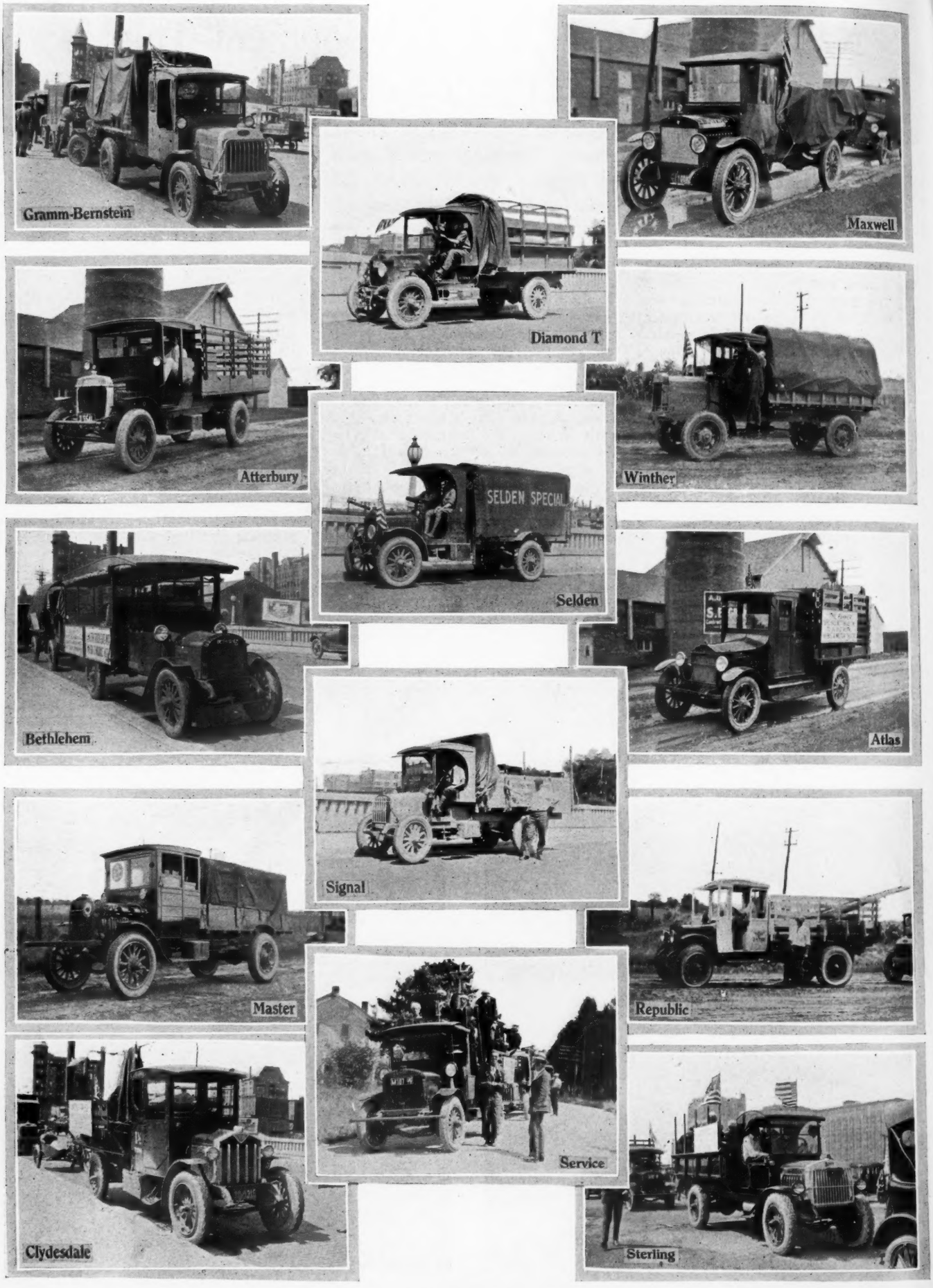
Parked for the night at Elgin, Ill.



A country road just after a heavy rain



Elgin reception committee meets the caravan



The trucks that are making the tour

afternoon. Commercial club and city officials met the truck train several miles east of the city and piloted it to the streets that had been cleared of vehicles that the trucks might park over night.

Actual Demonstrations Being Made Enroute

Several demonstrations had been arranged by the Elgin committee and trucks were dispatched to farms near Elgin to show the farmers first hand just what trucks could do on their own farms. Wheat was hauled from the fields to threshing machines, and later the grain was hauled to town either in sacks or grain tight bodies, and accurate costs were kept to show the farmers that motor trucks could do the work faster, cheaper and easier than the horses on which they have had to depend in the past.

Quick results were shown on this demonstration, for at the evening's show in town many farmers were on hand to look the trucks over and at least one local truck dealer reported a sale as a result of the caravan's visit. It should be thoroughly understood, however, that no trucks are being sold in connection with the tour, but dealers through whose territory the train passes are naturally alive to this opportunity to capitalize on the advertising value of the trip.

An early start was made Tuesday morning and at Belvidere, Ill., the train found a goodly crowd awaiting it. The trucks were parked, the sailors unlimbered their instruments and after a few selections, Mr. Kroh addressed the audience and drove home the motor truck propaganda which will bear fruit in future sales in that territory.

Rockford was reached shortly before noon, the train being met by a committee of local truck and auto men headed by "Judd" Joslyn, one of the veterans in the business in Northern Illinois. At Rockford the trucks were paraded around the principal business streets and then parked on the wide new concrete bridge over Rock river where many visited them while the drivers and others connected with the tour enjoyed a delicious dinner at the Nelson Hotel.

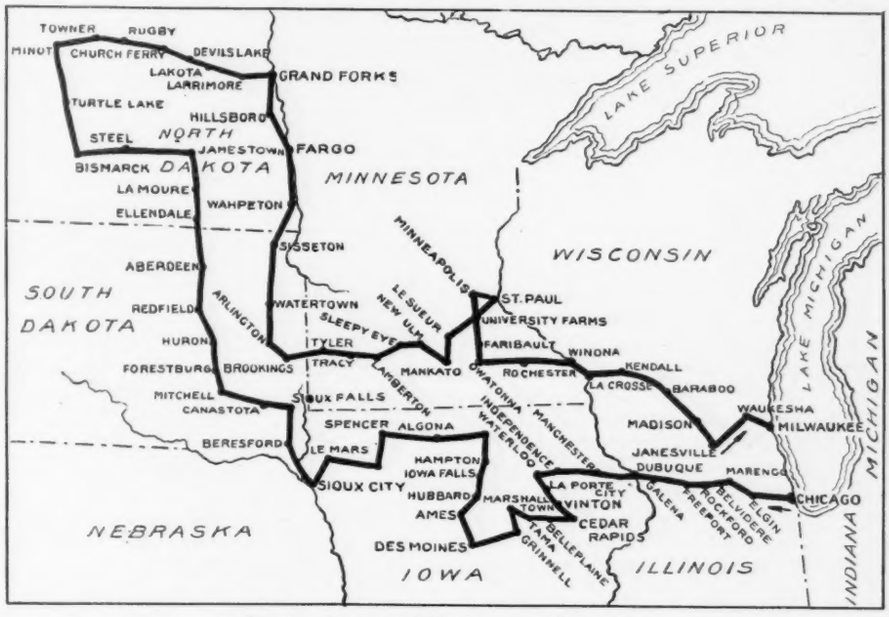
At 3.30 the trucks again set forth, and the night was spent at Freeport, where a fine program of speaking, etc., was put on before a large audience.

Each day's routine will be much the same till the end of the trip, except that at four points large dealers' meetings will be held in an effort to sell the dealer on more modern and efficient methods of selling the motor truck to the farmers in his territory.

Special Dealers' Meetings Will be Held

The first of these meetings was held at Des Moines, where local dealers raised a big fund to put it across as strong as possible. Dealers attended from all over the Iowa territory, and as a result of the interest engendered by the coming of the truck train, sales are expected to show a decided increase throughout this section.

Other dealers' meetings will be held at Sioux City, Fargo and Minneapolis and much good is expected to come from them. Factory and sales department of-



Showing the route which the convoy is covering



Trucks lined up just before the start from Grant Park, Chicago



Rolling along at top speed over fine concrete roads just west of Rockford, Ill.



Diamond T Farm Special hauls sacked wheat to town for farmer near Elgin



A. R. Kroh speaks to a rural audience at Belvidere, Ill.

ficials from all the truck companies participating in the tour are expected to attend and aid in better sales methods propaganda. Officials from the truck companies also plan to join the train from time to time enroute, to assist in every way possible in selling the motor truck idea to the farmer and dealer.

Organized for Publicity

The development tour was organized on the basis of giving the motor truck as a farm and rural transportation unit the widest possible publicity.

Headquarters were established in Chicago, in the Kimball Building, something over a month ago and there W. F. Sturm, director general of the tour, made his headquarters. Two men were dispatched ahead of the tour to stop in every city enroute, make arrangements with the local trade and commercial organizations and to visit local newspapers and get as much publicity in that way as possible. In most instances co-operation was extended generously by local interests, with the result that the countryside within a large radius of the cities visited was thoroughly awakened to the coming of the trucks.

In addition to this the United States Department of Agriculture notified all county agricultural agents along the route and all extension workers of the coming of the train, and urged them to do their utmost to get as large an attendance as possible from the rural sections along the way. This resulted in much good, also, as it put the government's seal of approval on the effort, and gave it added weight with the farming interests.

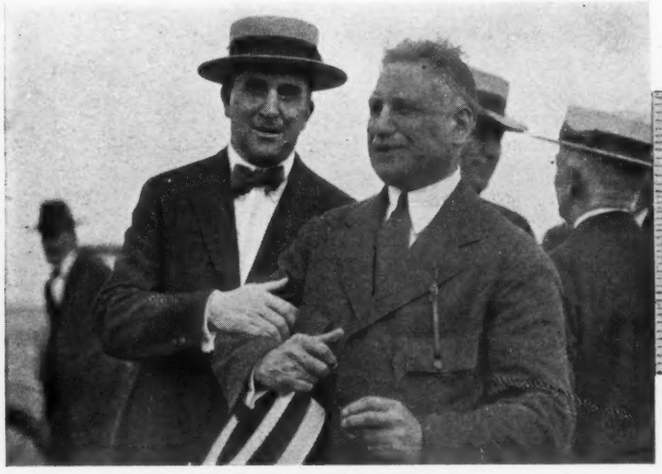


W. F. Holroyd, Firestone man, talks it over with W. L. O'Neill, manager of the Stromberg forces

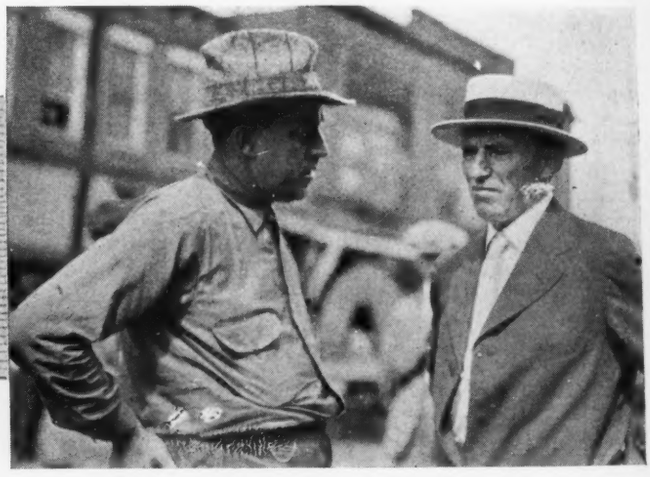
The Highways Transport Committee of the Council of National Defense and the Motor Truck Committee of the National Automobile Chamber of Commerce also co-operated in getting publicity and in furnishing literature for distribution on the way. Almost daily stories were sent out from the office of the director general to several hundred daily, weekly and monthly newspapers and farm and trade journals and all in all, the tour was given wider publicity than anything of the sort ever attempted hitherto.

In Chicago the local arrangements were in charge of a committee made up of L. H. Boydston, of the Service Motor Truck Co., chairman, and Messrs. Green, of the Goodyear company, Rehem, of the United States Tire Co., Howard, of the Goodrich Co. and Holroyd, of the Firestone Co. Mr. Boydston worked early and late for the success of the trip, and his energy and hard work had much to do with the success of the venture. He was ably assisted by the other members of the committee.

Back of those immediately in charge of the arrangements were the officers of



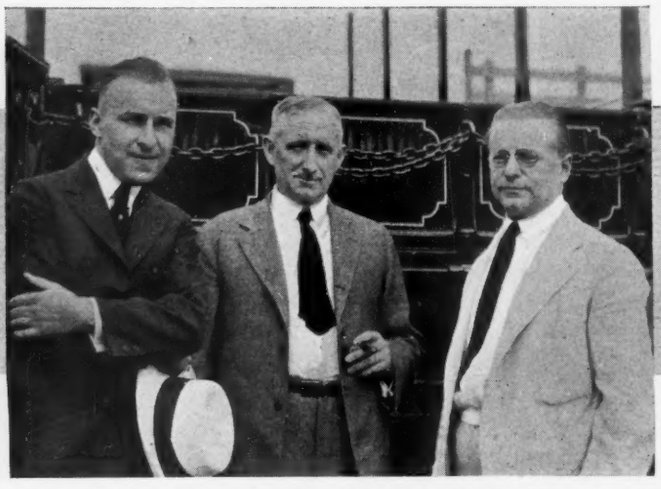
A. J. Whipple, sales manager Diamond T, and J. P. Kennedy of the Goodyear staff, at the start. Mr. Whipple is bareheaded



A. R. Kroh, who is doing most of the speaking enroute, selling a farmer on the use of the motor truck



S. Deutsch, vice president of Signal Truck Company, at the start



Officers of association at start in Chicago. Left to right, E. T. Herbig, secretary; John Tracy, president; Hal T. Boulden, vice-president



A. C. Burch, sales manager Clydesdale truck, at the start



A. E. Schafer, general sales manager Gramm-Bernstein trucks.

W. D. Rightmire, sales manager for Winther trucks, went part way.

"Judd" Joslyn, veteran automobileman, who met the caravan outside of Rockford

L. H. Boydston, of Service Motor Truck Company, chairman Chicago committee

W. F. Sturm, who was director general of the tour.

M. D. Scott, truck master, United States Navy.

Roy S. Davey, general sales manager Bethlehem trucks, was with the caravan

the National Association of Motor Truck Sales Managers and President John E. Tracy, Vice-Presidents Hal T. Boulden and W. D. Rightmire and Secretary E. T. Herbig all worked hard for the success of the tour. They had much to contend with and started the tour off successfully in spite of obstacles.

Results Expected of Trip

Many beneficial results are expected from this long tour. Principal among these is the proof of dependability of the modern commercial car. People are used to reading about the accomplishments of military trucks, but this is the first long distance tour of motor trucks, and it is expected that their performance on this tour will be such that their dependability will be proved beyond doubt to even the most critical.

In the various trucks taken on this tour will be found a combination of farm bodies to fit every need of the farmer, and the demonstrations which will be conducted wherever possible, doing the very work that the farmer would want a motor truck to do if he owned one, are expected to do more to convince the farmer that he needs motor trucks in his business than anything that has hitherto been used as an argument.

The tour will be a stimulation to truck dealers throughout the territory traversed, also, for it will bring them to a better realization of the splendid quality of the trucks they are trying to sell. They will also be taught better sales methods wherever there is time for meetings, and they will be put in closer contact with their factory organizations through meeting them enroute.

Accurate Costs Are Being Kept

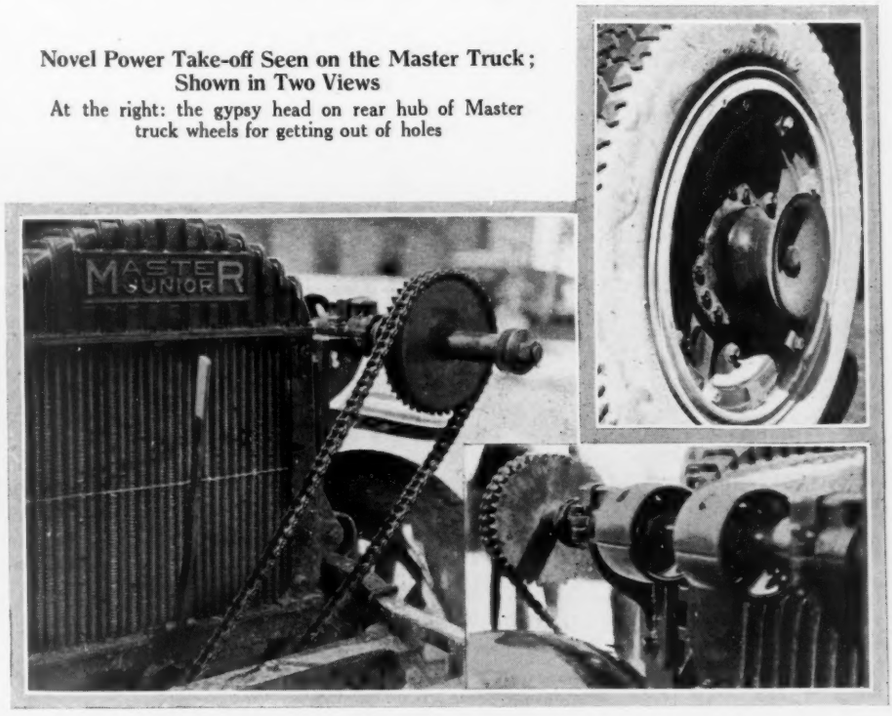
A cost accountant is being taken on the tour for the express purpose of keeping accurate costs, and when the trip is completed there will be a permanent record for every truck of the amount of gasoline and oil consumed, the tire cost, depreciation, repairs, in fact, an account covering every item of expense incurred on the trip, together with the exact distance covered as shown by daily odometer readings. Each driver is turning in a daily report sheet, which goes to Chicago headquarters for permanent tabulation.

A moving picture operator, who will take both "movies" and "stills" of the caravan along the way, the practical demonstrations of farm hauling and other interesting and instructive scenes, is being taken on the trip and these films, developed as quickly as possible after taking, will be shown at the various stops farther on in the route, with a projector that is being carried along as part of the train equipment.

These films will also be furnished the United States Agricultural Department after the tour, for showing in farmers' meetings and university extension work all over the United States, and they will

Novel Power Take-off Seen on the Master Truck; Shown in Two Views

At the right: the gypsy head on rear hub of Master truck wheels for getting out of holes





These Trucks Also Went Along to Give Service Enroute

Left to right: Firestone (Master); Standard Oil (Diamond T); Goodyear (Sterling)

also be shown officially in all of the countries in the Pan-American Union, thus extending the advertising value of this trip even into the countries of Central and South America.

It is not expected that the advantages to be gained by the tour will end with the conclusion of the trip. Follow up work both by the association and by individual manufacturers will be carried on long after the last truck lands at Milwaukee and the advantages to the industry as a whole are almost boundless.

Only pneumatic tires are being used on the trucks in the tour, as the manufacturers participating felt that this type of tire is the one that will make the truck most efficient and most satisfactory to the farmer during the greater part of the year.

Tour Briefs

A Goodyear service man takes pressure readings on every tire in the caravan every night, giving each driver a written report as to the condition of his tires.

M. D. Scott, who is in charge of the operation of the train, is the man who took the Goodyear transcontinental trucks on their perilous journey. He will get his train through, of that there is no doubt.

Each truck carries a sign calling attention of those along the way to some reason why farmers should buy motor trucks. The signs will have their effect.

The first day of the tour was the hottest day of the summer in the Chicago district, yet not a radiator boiled. Pretty good test.

The Vacuum Oil Co. has a representative with the tour to take care of the trucks' lubrication needs.

The Diamond T truck, on which the Standard Oil tank is carried on the tour, is a six-year-old job. Yet it is running as well as the day it left the plant.

The Winther is the only four wheel drive job in the caravan.

The Master entry has a new power takeoff attached on the left side of the hood, with power transmitted to the shaft by chain drive and clutch forward of the engine. It aroused interest among farmers, who will some day want their motor trucks to drive their ensilage cutters, elevators, feed grinders, etc.

The Goodyear and Firestone service trucks carry complete replacement tires for all trucks in the caravan.

The Goodyear Co. furnishes the Packard touring car which is being used as a pilot car for the entire trip. The Firestone Co. is furnishing a Cadillac touring car and local agents along the way are furnishing a Maxwell touring car between cities for the use of the officials of the caravan as they need them. Cooperation from these companies has been splendid in every way.

Mullins Body Corporation, Salem, O., has been reorganized with a preferred stock of $1,000,000 and a common stock of 70,000 shares. The company manufactures automobile bodies, fenders and parts for the Baker Electrics, the Packard, Cadillac, Pierce-Arrow, Locomobile, Peerless and Stearns passenger cars.

Stromberg Carburetor Company to Increase Capital

NEW YORK, N. Y., July 30.—A meeting of the stockholders of the Stromberg Carburetor Co. of America will be held in August to vote upon the recommendation of the directors that the capital stock be increased from 50,000 to 75,000 shares.

New shares are to be offered to the present stockholders at $45 each. A syndicate has been formed to underwrite this expansion.

Ford Company Now Controlled by Fords and Couzens

DETROIT, July 17.—All of the minority stock in the Ford Motor Co., except 2180 shares held by Mayor James Couzens, of Detroit, has been purchased by Edsel B. Ford, president of the Ford Motor Co. and son of Henry Ford, the founder of the company. Approximately $75,000,000 was involved in the deal which was financed through Stuart W. Webb, of Bond & Goodwin, and F. M. Holmes, of the old Colony Trust Co., of Boston.

Where Edsel Ford previously held 300 shares of Ford stock, he now owns 6120 shares, which with the 2180 shares still held by Mayor James Couzens makes up the total of 8300 shares formerly held by outside interests. Henry Ford owned and still owns 11,000 shares, so that his control of the company and its policies is not altered in the least.

The recent lawsuit of John F. and Horace E. Dodge, as a result of which the Ford Motor Co. was obliged to distribute over $19,000,000 in dividends which had been held back as accumulated surplus for expansion projects, is believed to have prompted the buying up of the minority stock by Edsel Ford.

The practically complete control of the Ford Co. by Henry Ford and his son Edsel, which results from the recent transfer of the minority stock, apparently disposes of the rumor that the General Motors Corp. was attempting to obtain control of the company.

Stewart Declares Dividend

At a regular monthly meeting of the Stewart Motor Corp., Buffalo, N. Y., a quarterly dividend of 2 per cent. on preferred stock and 2½ per cent. on common stock was declared.

The company is planning to move into its new plant within the next thirty days. The plant, which is modern in every detail, covers about nine acres of land. The present factory will continue to be operated in conjunction with the new plant and will greatly increase the production capacity of the company.

New Rubber Company Formed

CHARLESTON, W. VA., August 7.—A new company is to be organized for the manufacture of rubber products. The company, a $1,200,000 organization, will be known as the Virginia Rubber Co. The incorporators include V. E. Vining, A. J. Sobien and Houston G. Young.

International-Wright Merger Approved

NEW YORK, July 17.—Plans for the merger of the International Motor Truck Corp. and the Wright-Martin Aircraft Corp. have been approved by the directors of the two companies and will be carried out by a committee of leading shareholders of both concerns.

According to the plan, Wright-Martin preferred shareholders will receive $120 par value of International Motor first preferred for each of their present shares and accumulated dividends. Wright-Martin common holders will receive for each 100 shares 2.8 shares of second preferred and two shares of common stock of the International Motor besides twenty-five shares of no par value stock of the new Wright-Martin Co. which will conduct the business. There will be no change in the common shares of International Motor. Both first and second preferred shareholders of International Motor will retain their present holdings and receive in addition the amount of their accumulated dividends in the same class of stock now held at par.

Melhuish Resigns Presidency of Fulton

William Fulton Melhuish, Jr., has resigned as president of the Fulton Motor Truck Co., Farmingdale, Long Island, N. Y., to become actively associated at 40 Wall St., New York, with investment brokers specializing in motor and accessory securities, although he still remains the largest individual stockholder in the Fulton Co.

Mr. Melhuish organized the Fulton Motor Truck Co. about three years ago, designing and superintending the building of the factory in which the Fulton 1½-ton truck is produced.

L. C. Graves Company Complete Addition

The L. C. Graves Co., of Springsboro, Pa., who manufacture Commercial Car and Truck Bodies, have just completed an addition to their plant which will enable them to increase their production 50 per cent. The structure will be used to house the machining and iron departments.

In addition, the company is electrifying the entire plant and spending about $30,000 for new and modern machinery. All machines are to have individual motors and be so placed as to obtain the highest possible efficiency.

Tax Ruling on Parts and Accessories

WASHINGTON, D. C., July 21.—According to Commissioner of Internal Revenue Roper, parts and accessories purchased prior to Feb. 25 are taxable when sold in connection with a motor vehicle. The tax does not apply to such articles purchased by the dealer from a manufacturer before the same date and sold on or after Feb. 25, separately from the sale of the automobile.

Motor Transport Corps Convoy Making Rapid Headway

By A. V. COMINGS

WELL over toward the Pacific coast states and the end of its long journey, the transcontinental convoy of motor trucks sent out by the United States Army has made splendid progress and has more than come up to expectations. The truck train, starting from Washington July 7, has met with no difficulties too great to overcome, and has carried the message of motor truck reliability, the feasibility of highway haulage on a big scale, and the necessity of good roads, along hundreds of miles of highways where live tens of thousands of people now aroused for the first time to the bigness of the motor transportation idea. That this seed is planted in fertile territory is the conclusion reached by those who have followed the results of the trip closely.

The slow winding caravan has been given a most cordial reception all along the route, the overnight and Sunday rest stops being made the occasion for popular demonstrations of approval in almost all localities. Every opportunity has been given the officers with the convoy for gathering statistical data and information of all kinds that will be of value in the future, both from a military and business standpoint.

In those localities west of the Mississippi where military trucks have not been as familiar during the past two years as in the East, interest has, naturally, been greater. A realization of the size, the power, the brute strength of the modern motor truck has been brought to the very doors of potential buyers of tens of thousands of commercial motor trucks by the tour, which has paved the way for builders of motor trucks to go after business with a much better chance of interesting prospects.

The convoy is absolutely self sustaining, the officers sleeping in tents at each night's camp and the enlisted men sleeping in the open on cots when the weather is fine, and in tents when rain falls. A battery of kitchen trailers, made by the Trailmobile Co., of Cincinnati, and similar to those furnished the allied governments during the war, are part of the equipment, and no sooner is camp made each evening than the camp kitchens are unlimbered and soon the smell of savory cooking sets the boys to sniffing.

Included in the equipment of the convoy is a powerful searchlight, with its own generating outfit, and this has proved a great attraction in communities where such things have hitherto been unknown save through illustrations in magazines and newspapers. A huge pontoon, capable of floating any of the trucks over a stream, is also carried on a steel trailer, and this has attracted much attention.

One Militor is included in the convoy, this huge truck attracting attention even among expert engineers along the route. This Militor is the only one of those built during the war that is now in commission and it has proved its worth many times on this trip in hauling trucks out of difficulties, up steep grades, etc. It has hauled as many as five of the big trucks behind it on occasion. The big windlass mounted on the rear of the frame has power enough for all road emergencies, as has been demonstrated more than once on the trip.

Both the men and officers of the Motor Transport Corps and of the Engineering arm of the service, who make up the personnel of the convoy, are entitled to great credit for the manner in which the tour has been managed. Col. Charles McClure is in command.

Mohawk Rubber Co., Akron, Ohio, announces that W. G. Fitzgerald is now in charge of the company's San Francisco branch. The Jense-King-Byrd Co., 320-24 Riverside Ave., Spokane, Wash., is now the distributor of Mohawk tires in that territory, and Munnell-Sherrill, 40 First St., Portland, Ore., is distributor in that section.

The "X" Laboratories Move Overnight by Truck, From Boston to New York

NEW YORK, August 1.—The "X" Laboratories are now located at 25 West 45th street, New York City, having moved their entire offices overnight by motor truck from Boston.

Mr. L. J. Stern, general manager of the "X" Laboratories, said that for a long time the large increase of business made it advisable to consider moving, but unless the move could be made overnight the interruption to business would have been too serious. Consequently it was decided to use motor trucks.

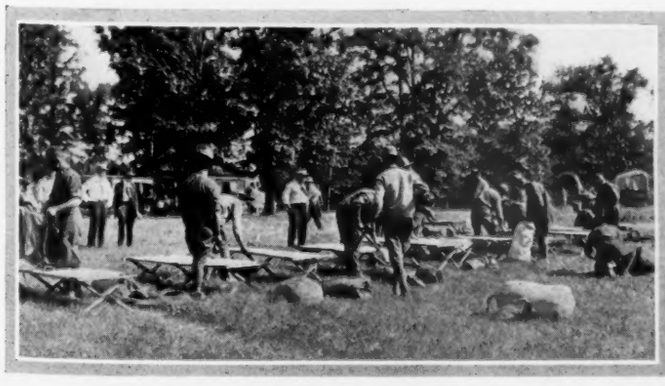
In the early afternoon of July 28 a fleet of motor trucks lined up in Washington street, Boston. With the utmost speed great quantities of furniture and office equipment were transferred to the trucks, and one after another they roared away on the journey to New York. The personnel of the company, numbering some 40 people, followed by train, and promptly at nine o'clock the next morning business was resumed in splendid new quarters at 25 West 45th street, New York. There was hardly any interruption or confusion. Every item of equipment was in its appointed place—an emergency force of men being on hand to meet the trucks when they arrived in the early morning hours.

Three new products are to be added to "X" line. One of these is the Rearometer, a distance indicator, built on the principle of a rear view mirror.

Only the general offices of the "X" Laboratories have been moved to New York. The factory in Boston is to be retained. An additional factory will be equipped in or near New York City.

May Have Used-Car Show in the Fall

NEW ORLEANS, LA., July 30.—Much interest is being shown in New Orleans in the possibility of a used car show this fall. At present the agitation over the valuation and handling of used cars is in the air. Therefore, it seems only logical that now is the time to hold such a show, for most of the farmers and people who are interested in used trucks and cars have sold their crops and have time and money to investigate this field.



The Enlisted Men Slept in the Open When the Weather Was Fair



The Government Truck Convoy Swinging Into a Town Enroute

What a Few Clicks of the Camera Show

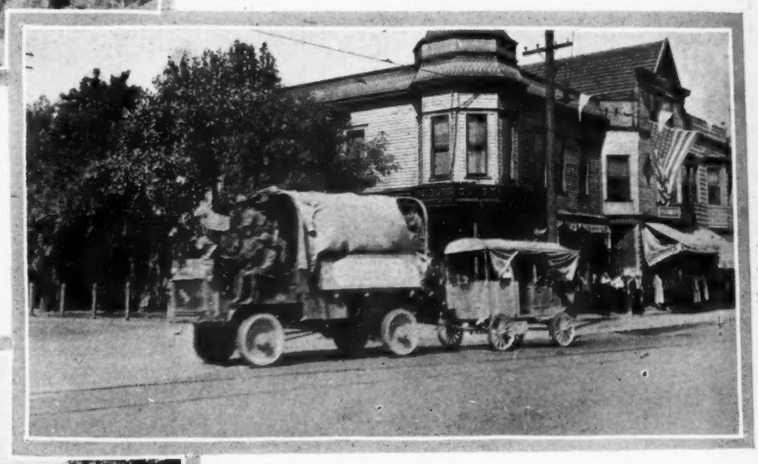


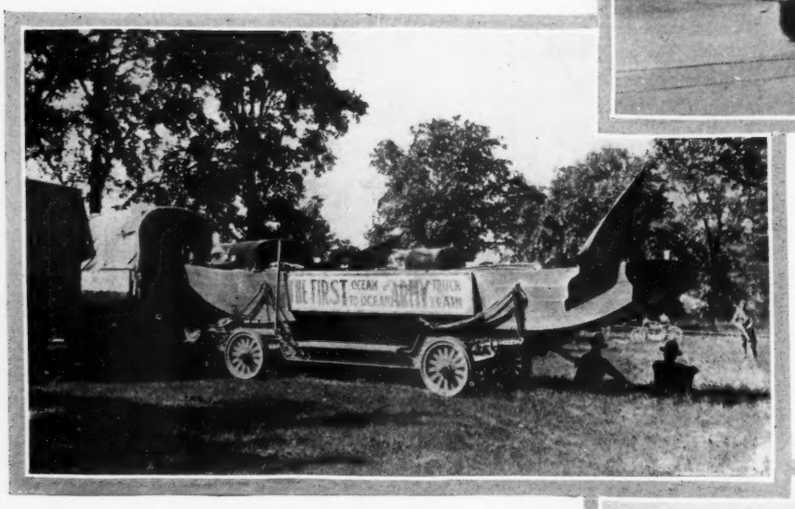
The Militor, that yanks the other trucks out of difficulties, either by towing or by its powerful windlass



Above: The convoy machine shop

Right: A four wheel drive and its trailmobile kitchen on the "march"





The army pontoon, carried in case of necessity of crossing swollen streams or where bridges break

Raymond Beck, of the promotion department of the Goodrich Tire and Rubber Company, who went part way with the convoy.





The Goodyear transcontinental Packard truck. On its second trip across, carrying a band donated by the Goodyear Company



EDITORIALS



Highway, Then Highway Transportation

IT is unfortunate, but true, that the controversy over good roads and transportation is very much on the same order as to whether the chicken or the egg came first. Both are with us. Highway improvement, however, has not kept pace with the tremendous increase in the utilization of motor trucks.

That a good road surface is fundamental and absolutely essential to economical highway transportation is axiomatic and does not need to be dwelt upon. In this issue will be found figures and charts showing how important road surface is when it comes to hauling heavy loads over highways.

It seems almost ridiculous when one considers that of our 2,500,000 miles of highways, only about 12 per cent. are in the improved class and that only one-fourth to one-third of one per cent. of these highways are really fit for economical truck transportation.

That these conditions will be improved and materially changed within the next few years is shown conclusively by the tremendous jump in appropriations for road building shown since the war, although it is nothing as yet to what is needed. The figures for 1919 as gleaned from all sources (which will be found tabulated in this issue) total approximately $350,000,000. There is a very widespread demand, and a demand which is ever increasing, for a system of truly national highways under Federal control; a system which could be used in emergency for economical war transportation purposes.

The country as a whole is sorely in need of connecting highways which will link up from state to state. It is commonly known that good roads in one state are very apt to end at the border line. Beyond that border the road often drops off into a mud hole. What we need for the immediate future development of highways transportation is inter-state roads to take care of inter-state commerce by trucks.

Although highway building is not the field for the truck manufacturer or dealer, still it is so essential to his business that he must be actively identified and associated with the good roads movement in his territory. Highway and highway transportation must be in the thoughts and on the tongue of every man in the motor truck industry. The development of highway transportation by motor bids fair to be one of the greatest single developments in the history of the country.

Our September Issue

MOTOR truck dealers who are looking forward to the winter months with the idea of assisting owners in keeping their trucks in continuous operation throughout the winter, will be interested in the next issue, which will, as usual, be our "Winter Equipment Number." It is our object to show in that issue the latest accessories and commodities which are designed to keep trucks in good running shape during winter months.

The dealer who is anxious to increase his profits and make his establishment of more service to his customers should start now in planning for his winter stock of accessories. Some trucks will need cabs, carburetor heating devices, non-skid devices, anti-freeze solutions, etc.

The dealer who has show room space to spare can make good use of it by displaying some of these goods. Letters should be sent out to customers asking them to have their trucks brought in for an inspection, and any attachments or changes that should be made on the truck for winter use should then be discussed. The high-class operator demands a certain amount of comfort and he is entitled to it. The next issue will describe and illustrate the latest winter equipment as well as things for the comfort of the driver.

We shall be pleased to hear from manufacturers who have any new commodities to offer along the above lines.

A Bad Practice

MUCH has been said of the difficulty and the evils of trying to operate a truck and passenger car agency at the same time. However, this is being done very successfully by a large number of dealers throughout the United States, which proves that there is no inherent reason why it cannot be done, but merely that the method of doing this is responsible for success or failure.

There is, however, an evil which often creeps in but is due not to the dealers but to the manufacturers. We are speaking now of a custom which is prevalent among certain makers of both trucks and passenger cars, namely, that of forcing the dealer to take a certain number of vehicles of one kind with so many vehicles of the other kind. They may also make them take one truck with every five-passenger car or whatever the shipment may be.

This is not sound business and is usually resorted to as a means of moving stock that has been found difficult to move otherwise.

There should be no coercion on the part of the manufacturer. Dealers should be allowed a free hand as to the choice of the vehicles which they will handle. Dealers often put up with this sort of business because the passenger car end of it (or the truck end of it, whichever it may be) is good, and in order to hold this business they will take the vehicles that are forced upon them.

It is needless to say that the methods of marketing the vehicles which dealers have forced upon them are not always of the highest standard. These extra vehicles are looked upon as a necessary evil and any method of getting rid of them is usually employed. This naturally results in cut price methods and in practices which are certainly not uplifting to the trade. The fault, however, is largely with the manufacturer who uses this method of disposing, of a part at least, of his product.

National Automobile Chamber of Commerce Committees Appointed

Charles Clifton, president of the National Automobile Chamber of Commerce has appointed the following committees which are to handle the activities of the business organization during the coming year:

Patents Committee

C. C. Hanch, chairman, Maxwell Motor Co.; Windsor T. White, White Motor Co.; C. W. Churchill, The Winton Co.; Wilfred C. Leland, Lincoln Motor Co.; Wm. MacGlashan, Studebaker Corp.; Robert A. Brannigan, Mgr., Nat'l Auto. Chamber of Commerce.

Legislative Committee

H. H. Rice, chairman, Chevrolet Motor Co.; D. C. Fenner, Mack Bros. Motor Car Co.; J. I. Farley, Auburn Automobile Co.; J. I. Barrows, Lexington Motor Co.; David Ludlum, Autocar Co.

Highways Committee

R. D. Chapin, chairman, Hudson Motor Car Co.; W. E. Metzger, Columbia Motors Co.; Royal R. Scott, Willys-Overland Co.; S. M. Williams, Garford Motor Truck Co.; Geo. M. Graham, Pierce-Arrow Motor Car Co.; Pyke Johnson, secretary, Nat'l Auto. Chamber of Commerce.

Traffic Committee

William E. Metzger, chairman, Columbia Motors Co., A. I. Philp, Dodge Bros.; F. C. Chandler, Chandler Motor Car Co.; William L. Day, General Motors Truck Co.; Geo. Dickson, Nat'l Motor Car & Vehicle Co.; J. S. Marvin, manager, Nat'l Auto. Chamber of Commerce.

Electric Vehicle Committee

W. C. Anderson, chairman, Anderson Electric Car Co.; Fred R. White, Baker R & L Co.; H. W. Suydam, Milburn Wagon Co.

Membership Committee

C. W. Churchill, chairman; The Winton Co.; J. Walter Drake, Hupp Motor Car Corp.; Hugh Chalmers, Chalmers Motor Co.

Foreign Trade Committee

J. Walter Drake, chairman; Hupp Motor Car Corp.; Peter S. Steenstrup, General Motors Truck Co.; H. M. Robins, Dodge Bros.; Jay Rathbun, White Motor Co.; E. C. Morse, John N. Willys Export Corp.; J. P. Roberts, Studebaker Corp.; H. B. Phipps, Hudson Motor Car Co.; H. R. Cobleigh, secretary, Nat'l Auto. Chamber of Commerce.

Conservation Committee

W. C. Sills, chairman, Chevrolet Motor Co.; T. R. Lippard, Stewart Motors Corp.; M. Cook, Service Motor Truck Co.; F. E. Bradfield, Velie Motors Corp.; C. A. Baird, Jas. Cunningham Son & Co.

Motor Truck Committee

Windsor T. White, chairman, White Motor Co.; Alvan Macauley, Packard Motor Car Co.; George M. Graham, Pierce-Arrow Motor Car Co.; Victor L. Brown, Sterling Motor Truck Co.; M. L. Pulcher, Federal Motor Truck Co.; R. H. Salmons, Selden Motor Vehicle Co.; D. C. Fenner, Mack Bros. Motor Car Co.; F. W. Fenn, secretary, Nat'l Auto. Chamber of Commerce.

Rural Motor Express Committee

James L. Geddes, chairman, Kelly-Springfield Motor Truck Co.; E. A. Williams, Jr., Garford Motor Truck Co.; O. H. Browning, International Harvester Corp.; A. T. Murray, Bethlehem Motors Corp.; Geo. D. Wilcox, Commerce Motor Car Co.; F. W. Fenn, secretary, Nat'l Auto. Chamber of Commerce.

Truck Standards Committee

David C. Fenner, chairman, Mack Bros. Motor Car Co.; Francis W. Davis, Pierce-Arrow Motor Car Co.; F. A. Whitten, General Motors Truck Co.; B. M. Sternberg, Sterling Motor Truck Co.; F. F. Beall, Packard Motor Car Co.

Hand-Book Committee

E. T. Strong, chairman, Buick Motor Co.; F. H. Akers, Reo Motor Car Co.; Geo. A. Kissel, Kissel Motor Car Co.; Wm. T. White, Mercer Auto Co.; Chas. Denby, Denby Motor Truck Co.

Truck Committee on Standard Repair Parts and Service Policies

E. T. Herbig, chairman, Service Motor Truck Co.; H. W. Drew, Packard Motor Car Co.; W. M. Ladd, Pierce-Arrow Motor Car Co.; A. B. Cumner, Autocar Co.; W. M. Britton, Republic Motor Truck Company.

Coming Events

Aug. 20-29, **Des Moines, Ia.**—Automotive Show, Machinery Hall.
Aug. 26-29, **Madison, Wis.**—Midsummer Car, Truck and Tractor Show.
Aug. 30-Sept. 6, **Minnesota.**—State Fair.
Aug. 31-Sept. 5, **Lincoln, Neb.**—Car, Truck and Tractor Show.
Sept. 1-5, **Hartford, Conn.**—Automotive Show.
Sept. 1-5, **Wheeling, W. Va.**—Car, Truck and Tractor Show.
Sept. 1-6, **Rochester, N. Y.**—Automotive Show.
Sept. 1-6, **Greenville, S. C.**—Southeastern Good Roads Congress and Farm Tractor Exposition.
Sept. 1-6, **Spokane, Wash.**—Automotive Show.
Sept. 8-12, **Milwaukee, Wis.**—Automotive Show.
Sept. 22-25. **Philadelphia, Pa.**—Annual Convention, National Association of Purchasing Agents. Bellevue-Stratford Hotel.
Sept. 22-27, **Pueblo, Colo.**—Car, Truck and Tractor Show.
Sept. 24-Oct. 4, **Kansas City, Kans.**—Car, Truck and Tractor Show.
Sept. 29-Oct. 4, **Muskogee, Okla.**—Car, Truck and Tractor Show.
Sept. 29-Oct. 4, **Chattanooga, Tenn.**—Automotive Show.
Sept. 30-Oct. 4, **Lancaster, Pa.**—Automotive Show.
October, **Columbia, S. C.**—Automotive Show.
Oct. 1-14, **Lyons, France.**—Fair.
Oct. 9-19, **Paris, France.**—International Exposition of Automobiles.
Oct. 20-25, **Raleigh, N. C.**—Car, Truck and Tractor Show.
Oct. 22-27, **Shreveport, La.**—Car, Truck and Tractor Show.
Jan. 3-10, 1920, **New York, N. Y.**—Truck Show, 22nd Regiment Armory.
Jan. 24-31, 1920, **Chicago, Ill.**—Truck Show, Drexel Pavilion.

Massachusetts Now Has Motor Truck Club

BOSTON, MASS., Aug. 3.—An organization to be known as the Motor Truck Club of Massachusetts has been formed by motor truck owners of this state. It has for its purpose the promotion of the interests of owners of commercial vehicles.

Some of the objects for which the club has been formed are: The reduction of the number of accidents through educational measures; a course of instruction for drivers and owners who desire to become more familiar with the mechanism of their trucks; co-operation with the Boston Commercial Vehicle Dealers' Association, Massachusetts State A. A., the Bay State A. A., the Garage Association of Greater Boston, Massachusetts Operators' Association, etc., in protest against unfair legislation.

News of the Trade in Brief

Sales to States Now Taxable

WASHINGTON, Aug. 6.—According to a recent treasury decision manufacturers, producers, importers and vendors are subject to excise taxes upon sales of taxable articles even when sales are made to a State or political subdivision thereof, unless taxing act specifically exempts them from tax upon such sales. Article 10 of Regulations 47, and Article 6 of Regulations 48, are amended.

This means that every sale of an automobile or truck to any of the States or political subdivisions thereof made since October 3, 1917, is now held to be taxable, and every sale of a tire, inner tube, part or accessory made since February 25, 1918, to any of the States or political subdivisions thereof is taxable.

This is in spite of the fact that tax Regulations 44 approved May 31, 1918, by the Commissioner of Internal Revenue provided that under the Act of 1917 such articles sold to a State or political subdivision thereof were not taxed, and in spite of the fact that the unofficial advice of the Revenue Bureau from February to May, 1919, was to the effect that neither sales to the Government nor to the States would be taxed under the present law, and in spite of the fact that Regulations 47 approved May 1, 1919, interpreting the present law, while holding that sales to the Government were taxable, confirmed the understanding that sales to the States or political subdivisions thereof were tax free.

New Laws Regarding Motor Vehicles in Massachusetts

BOSTON, July 20.—A law providing that motor trucks, commercial vehicles and taxicabs must be equipped with mirrors goes into effect in Massachusetts on September 3. Another law relates to the theft of cars and trucks and provides a drastic penalty for stealing.

Registration fees for trucks, over which there has been so much controversy have been changed to $10 a ton, electric trucks paying half that fee, trailers with metal tires double the fee and trailers with pneumatic tires half the fee. It is effective October 7.

A law relating to used cars divides men and firms handling used cars into three classes. Agents for new vehicles are placed in Class 1; dealers in used cars solely, Class 2; dealers buying vehicles for junk, Class 3. Classes 2 and 3 must hold all cars at least four days and send report daily of such vehicles taken in to Highway Commission and local police. With permission of the authorities they may sell before four days. Class 1 is not restricted to holding cars, but must report weekly all vehicles taken in trade. A license fee of not more than $50 yearly must be paid. And finally, a private owner may not sell his vehicle to any person until he has notified the Highway Commission and local police four days ahead of the sale. This law is effective September 25.

More Truck Tours Planned

ST. LOUIS, Aug. 1.—The recent truck demonstration at St. Louis (June 9 to 13), is to be followed by another, probably late in August or early in September, taking in the Missouri State Fair at Sedalia. Many towns have expressed regrets that the recent tour did not include them and have expressed the hope of being included in the forthcoming tour.

Participation in this demonstration cost each dealer less than $100 per unit.

Further demonstrations:

Buffalo, N. Y., first week in September. For particulars apply H. M. Damon, Sentinel Motor Co., Buffalo, N. Y.

Toronto, Canada, second week in September. For particulars apply W. G. Robertson, Ontario Motor League, Lumsden Building, Toronto, Ont.

Minneapolis, Minn., third week in September. For particulars apply P. M. Gunsaulus, Firestone Tire & Rubber Co., Minneapolis, Minn. (which takes in Minnesota State Fair.)

Madison, Wis., August 26-29. For particulars apply Don. E. Mowry, Gen. Secy., Madison Association of Commerce, Madison, Wis.

Indianapolis, Ind., For particulars apply Tom Snyder, Indianapolis Chamber of Commerce, Indianapolis, Ind.

N. A. A. C. Holds Election

NEW YORK, N. Y., July 20.—At a directors' meeting held in Buffalo, Chas. Clifton was reelected president of the National Automobile Chamber of Commerce. All other officers were likewise reelected. These officers are: Hugh Chalmers, first vice-president; R. D. Chapin, second vice-president (passenger car division); Windsor White, second vice-president (motor truck division); C. C. Hanch, secretary, and H. H. Rice, treas.

The Cleveland Automobile Co., Cleveland, O., and Holmes Automobile Co., Canton, O., were elected to membership.

Voters of Oklahoma to Decide Truck License Fees

OKLAHOMA CITY, OKLA., Aug. 5.—The Seventh Legislature of the State of Oklahoma, at the regular session of that body, 1919, passed what is known as House Bill No. 509, which would increase the license fees paid by the owners of trucks.

The fees, as provided by the bill, would be on trucks having a carrying capacity of:

1500 lb. and under	$15.00
1500 to 2000 lb.	20.00
2000 to 3000 lb.	25.00
3000 to 4000 lb.	40.00
4000 to 6000 lb.	60.00
6000 to 8000 lb.	100.00
8000 to 10,000 lb. and up	300.00

The Oklahoma Association of Motorists, through Manager Geo. W. Woods, immediately started the circulation of petitions and have been successful in securing a sufficient number of signatures to have the bill submitted to the voters of the state at their next general election, for approval or rejection.

Import Embargoes Lifted in England

LONDON, July 23.—Embargo on English automobile imports is partially lifted. This affects trucks of 1½-ton capacity and less and increases the number of passenger cars admissable on a pre-war basis, making a total of 5000 to be distributed throughout the importing trade upon a new allotment basis. The relief of the truck situation is in the form of a ruling by the Board of Trade which effects a general import license for commercial vehicles not exceeding 300 cwt. in any quantity desired.

The passenger car ruling provides for the admission of 5000 cars in excess of the existing permits in the proportion that each distributor's imports during the years 1912-1913, inclusive, bears to the total importation during that year, exclusive of war orders. Licenses will be obtainable as soon as the American Chamber of Commerce in London submits the necessary statistics.

Paris Show May Have Separate Building for Trucks and Engines

PARIS, FRANCE, July 30.—The Paris Salon, the first of a series of European automobile shows, will be opened October 9. It was originally planned to hold the show in the Grand Palais but the applications for space have been so numerous that it has been decided to erect a temporary structure near the Palais for exhibiting the trucks and stationary engines. If this is done the Palais will be devoted exclusively to the display of passenger cars, bodies and accessories.

Since this is the first show to be held since the signing of the armistice, a large amount of floor space will be given to the display of all kinds of motor cars used in the war. This exhibit will include armored cars, tanks, searchlight cars, ambulances, automotive gun carriages, and balloon winches.

Investigation of German Trucks Planned

WASHINGTON, Aug. 4.—Representatives of the Society of Automotive Engineers, the National Automobile Chamber of Commerce, and The Motor and Accessory Manufacturers' Association, in conference with officers of the Motor Transport Corps of the American Army, last week formulated plans for the proposed research investigation of the 47 German motor trucks recently brought to this country by Lieut. Colonel A. J. Slade under the terms of the armistice.

These trucks were selected by Colonel Slade from 1250 turned over by Germany to the United States under the terms of the armistice. They represent the best available samples of current German practice in truck construction. The Motor Transport Corps felt that an investigation of these trucks would be of great value both to the industry and to the Government, and with this end in view made preliminary plans for testing and examining them, inviting co-operation of the industry in the matter.

It was decided to place L. P. Kalb, of the Standard Parts Co., in charge of the work for the entire industry. He will represent the three associations. Mr. Kalb is chairman of the Truck Standards Division of the Standards Committee of the Society of Automotive Engineers. During the war he was a major in the Motor Transport Corps and took a leading part in the standardization of the army motor truck.

Mr. Kalb has gone to Washington to confer with the officials of the Motor Transport Corps and to look over the trucks in a preliminary way. He will then map out a detailed program for the investigation, and will determine the size and character of the organization necessary to carry out the work so as to be of the broadest benefit to the industry and the Government.

The action on this matter was started on July 12, when Colonel W. F. Herringshaw, Chief Special Service Division of the Motor Transport Corps, Washington, D. C., addressed a communication to the Society of Automotive Engineers, the National Automobile Chamber of Commerce and The Motor and Accessory Manufacturers' Association, inviting their co-operation in a comprehensive investigation of the German trucks. The following excerpts from the communication indicate the general scope and purpose of the investigation:

"It will probably be desirable to determine the performance characteristics of some of the vehicles. This matter is now being studied but it is suggested that a short road test be made on each truck, in order to determine the fuel consumption per mile and per ton mile. It is hoped also to make arrangements so that tests will be made of the typical engines, steering gear, transmissions, rear axles and brakes. It is believed also that some samples should be taken of the more important parts of each unit for the purpose of chemical analysis. It may be possible to determine the physical properties of some of these parts. If it can be obtained, the complete transmission efficiency, engine to rear wheels, will be valuable. It is believed that such a measurement will be more useful than the drawbar pull. Most of the German trucks, of course, are fitted with steel tires so that any drawbar measurements would not compare with American practice.

"After a general study has been made of the truck, it has been suggested that some of the important parts be lent to manufacturers who might make a closer study of such parts as the engine, carburetor, transmission and magneto. It is possible that such an arrangement might be worked out with the understanding that a complete report of each study was to be made available to the Motor Transport Corps and to the industry in general."

Types of Motor Vehicles to be Retained by Army

WASHINGTON, August 4.—Brigadier General Drake, Motor Transport Corps, announces that the following types of trucks will be retained by the Army:

Type 2: Light delivery truck: ½-ton light delivery, Dodge; ¾-ton White; ¾-ton G. M. C.; 1-ton, White, Tebo.

Type 3: 1½ and 2-ton trucks: White, Garford, Packard.

Type 4: 3- and 4-ton trucks: Standardized "B," Riker, Mack 3½-ton trucks, F. W. D.

Type 5: Five-ton trucks or over: Mack 5½-ton trucks, Mack Special Engineer.

Type 7: Ambulances: G. M. C.

Type 8: Trailers, cargo: Trailers, ¾-ton, tank, water, 180 gal.; trailers, ¾-ton, ration and spare parts; trailer, 1½-ton, 2-wheel, light aviation; trailers, 1½-ton, 4-wheel, cargo; trailers, 1½-ton, 4-wheel special bodies; trailers, 3-ton, gun and caisson; trailers, 4-ton, 4-wheel, cargo; trailers, 4-ton, 4-wheel, special bodies; trailers, 5-ton, tire press; trailers, 10-ton, portable crane; trailers, 10-ton, tank corps with ramp.

Type 9: Trailer, kitchen: Trailers, 1½-ton, 2-wheel, kitchen, A and B type.

Type 10: Trailers, machine shop: Trailers, 4-ton, 4-wheel, machine shop—spare parts.

None of these machines will be placed in the surplus equipment. The statement says specifically that these cars are not placed as Army standards at present.

Public Conference to Standardize Invoices

NEW YORK CITY, Aug. 6.—The Standardization Committee of the National Association of Purchasing Agents, has called a conference of individuals and representatives of associations at the Bellevue-Stratford Hotel, Philadelphia, on Saturday, September 20, at 10 A. M. to consider the subject of standardization of forms for invoices and related documents.

The Standardization Committee of the National Association of Purchasing Agents is composed of the following members: W. L. Chandler, chairman, Dodge Sales & Engineering Co., Mishawaka, Ind.; W. V. C. Bulkeley, Liberty Steel Products Co., Woolworth Bldg., New York City; H. H. Meehan, A. B. Dick Co., Chicago, Ill.; A. Lockwood, Lumen Bearing Co., Buffalo, N. Y.; F. L. Kulow, Willard Storage Battery Co., Cleveland, Ohio. Anyone interested in the conference may address the chairman or any member of the committee.

The Federal Trade Commission Makes Recommendations Concerning Resale Prices

WASHINGTON, July 18.—The Federal Trade Commission in a special report to Congress today renewed its recommendation made last December that manufacturers be permitted by law to fix and maintain resale prices, subject to review by a disinterested agency.

The Commission says that such a law would remove present complexity in the business world, promote the efficiency of manufacturing and commercial institutions and serve the interest of the consuming public.

Under the Commission recommendation manufacturers desiring to fix and maintain resale prices would file with an agency to be designated by Congress, descriptions of their articles, contracts of sale, and the price schedules to be maintained. The disinterested agency would be charged with the duty, "upon complaint of any dealer or consumer or other party at interest," to review the terms of contracts and prices.

The Commission's recommendations, it stated, were based on the following conclusions:

(1). That producers of identified goods should be protected in their intangible property right or good-will created through years of fair dealing and of sustained quality of merchandise;

(2). That the unlimited power both to fix and to enforce and maintain resale prices may not be made lawful with safety; and

(3). That unrestrained price-cutting is not in the public interest, and tends, in the long run, to impair, if not to destroy, the production and distribution of articles desirable to the public.

Advancement of Date of the Importation of Tin

WASHINGTON, July 24.—The War Trade Board Section of the Department of State announces that W. T. B. R. 799, issued July 2, 1919, has been amended so as to advance from September 1, 1919, to August 15, 1919, the date on and after which pig tin and all metal alloys containing tin, including tin drosses, tin oxides, solder drosses, type metals, antifriction metals, waste metals, and other metals containing tin may be imported from points other than points of origin and without reference to the date.

Recent Changes in Automobile Tax Ruling

WASHINGTON, July 23.—(A). The Federal Internal Revenue Bureau has just issued Treasury Decision No. 2893, the provisions affecting the automobile industry being as follows:

"EXCISE TAXES ON SALES BY THE MANUFACTURER—Section 900.

(B) (1) **Articles consigned to retailer.**—The last sentence of article 8 of Regulations 47 is hereby amended to read as follows:

Where a manufacturer consigns articles to a retailer, retaining ownership in them until they are disposed of by the retailer, the manufacturer must pay the tax upon the basis of the manufacturer's selling price on all goods sold to the retailer, as shown by reports to be procured by him monthly from the retailer.

(C) (2) **Tires, inner tubes, parts or accessories.**—Article 14 of Regulations 47 is supplemented by adding thereto the following:

The words "tires, inner tubes, parts, or accessories" shall be understood to embrace only such tires, inner tubes, parts, or accessories as have reached such a stage of manufacture that they constitute articles commonly or commercially known as "tires, inner tubes, parts, or accessories" and shall not be understood to embrace raw materials used in the manufacture of such articles. Unvulcanized sheet rubber, liquid vulcanized rubber cement, and friction fabrics are considered to be raw materials and are exempt from tax.

(D) (3) **Definition of chassis and parts.**—The last two sentences of Article 15 of Regulations 47, modified by T. D. 2852, are hereby further modified to read as follows:

A chassis provided with a superstructure of such design that it is without substantial additions adaptable for hauling heavy loads is an "automobile truck" or "automobile wagon" and taxable at the rate of 3 per cent. when sold by the manufacturer thereof. A chassis **not** so equipped is an "other automobile" or a "part" taxable at the rate of 5 per cent. when sold by the manufacturer thereof unless (1) the manufacturer has actual knowledge from the construction of the chassis which he sells that it is to be used as an automobile truck or automobile wagon or has in his possession at the time the chassis is shipped or sold (whichever is prior) an order or contract of sale with a certificate of the purchaser in writing, printed thereon or permanently attached thereto, showing that the chassis specified in the order is to be so used, in which case the chassis will be taxable at the rate of 3 per cent. when sold by the manufacturer thereof; or (2) unless the manufacturer has in his possession at the time the chassis is shipped or sold (whichever is prior) an order or contract of sale of the purchaser in writing, printed thereon or permanently attached thereto, showing that the chassis specified in the order is to be used in the further manufacture of an automobile truck, automobile wagon, or other automobile, in which case the chassis may be sold as a "part" free from tax if the purchaser furnishes the certificate provided for in Treasury Decision 2852 for purchasing parts tax free.

(E) In the case of a chassis which is taxable as an automobile truck or automobile wagon at the rate of three per cent., or in case the chassis is taxable as an "other automobile" at five per cent., the manufacturer of the chassis must return the tax to the Government in all instances. In case the purchaser of the chassis reimburses the tax to the manufacturer and further completes the chassis by the addition of a body and sells the completed automobile truck or automobile wagon or other automobile, the tax must be paid on the selling price of the complete automobile truck, automobile wagon, or other automobile less any tax already reimbursed to the manufacturer of the chassis.

(F) A body being a part, a taxpayer who purchases such an article for use in further manufacturing an automobile truck, automobile wagon, or other automobile may purchase it tax exempt by furnishing the certificate provided for in Treasury Decision 2852 for purchasing parts tax free. After the date of the approval of this Treasury Decision, unless the certificate provided for in Treasury Decision 2852 for the purchase of tires, inner tubes, parts, or accessories tax free is furnished with the order, in all cases where a subsequent manufacturer reimburses the prior manufacturer for tax, if such subsequent manufacturer uses such tires, inner tubes, parts, or accessories in the manufacture of an automobile truck, automobile wagon, other automobile, motorcycle, tire, inner tube, part, or accessory, he must take credit for the tax so reimbursed in the same manner as is provided in the case of a chassis.

(G) The term "superstructure" is deemed to mean any chassis frame of steel or wood or other material which is adaptable by the addition of a few bolsters or planks for carrying a heavy load.

(H) If a person, partnership, or corporation manufactures for sale separately parts or accessories and is also engaged in the business of repairing and rebuilding automobiles, automobile trucks, automobile wagons, other automobiles, or motorcycles, such parts or accessories used for repair or rebuilding purposes are subject to taxation upon the amount charged for the entire job, unless the amount charged for the parts so used is billed separately, in which case the tax will attach to the sale price of the parts only. A person, partnership, or corporation doing strictly a repair business and manufacturing only such parts as are needed for an immediate job is not subject to the tax imposed under section 900, such parts being exempt.

(I) (4) **Parts or accessories.**—Article 16 of Regulations 47 is supplemented by adding thereto the following:

Parts or accessories for automobile trucks, automobile wagons, other automobiles, or motorcycles primarily adaptable for use on or in connection therewith when sold for any other purpose are not taxable provided the purchaser files with his order a statement that such parts or accessories are to be used on or in connection with another article of commerce not enumerated or included in subdivision (1), (2), or (3) of Section 900. For example, a self-starter primarily adaptable for use on an automobile, if sold to a manufacturer of motor boats, such manufacturer stating in his order that it is to be used in the manufacture of a motor boat and not upon an automobile, is not taxable.

Special Taxes—Section 1001 (11)

(J) (1) **Motor busses.**—A person operating motor busses along established or recognized routes, charging patrons a fixed charge per ride, is carrying on a business of operating passenger automobiles for hire, and is, therefore, liable to the tax imposed by subdivision (11) of section 1001.

(K) (2) **Automobile hearses and ambulances.**—An automobile hearse or ambulance, even though having a seating capacity of more than two persons, operated for hire, is not a passenger automobile subject to tax under the provisions of subdivision (11) of section 1001. However, passenger automobiles for hire in conveying persons to funerals are subject to tax under subdivision (11) of section 1001.

Paragraph D contains the following new provisions:

(L.) First, the manufacturer of a chassis is justified in treating it as a chassis of an automobile truck or automobile wagon, taxable at three per cent., if he can tell from the way the chassis is constructed that it is to be used for this purpose.

(M.) Second, the chassis manufacturer can treat the chassis as a "part" if he so elects, provided the buyer gives him the required certificate to the effect that the chassis is to be used in the manufacture of a complete automobile or automobile truck or wagon. The advantage of this second method is that these sales can be made to the buyer tax free, so that the chassis manufacturer is free from the trouble of taking care of the tax. But note that in any event the one who buys the chassis and completes it and then sells the complete vehicle is taxed the proper percentage of his selling price, less the tax, if any, that he has reimbursed to the chassis manufacturer.

(N.) In other words, the Government gets its proper tax no matter what method is used, but the chassis manufacturer may find one method preferable to another, due to his particular circumstances.

(O.) Paragraph G means that the manufacturer selling a chassis equipped with a super-structure as defined, is justified in calling such chassis an automobile truck or wagon taxable at three per cent.

(P.) The new feature of paragraph H is that one who only manufactures such parts or accessories as are needed for a particular repair job is not subject to the "parts" tax.

(Q.) Paragraph I means that parts or accessories, even if they can be used for automobiles or motorcycles, are not taxed if they are sold for any other purpose provided the purchaser makes a statement to this effect.

(R.) Paragraph J means that those operating busses as defined, are subject to an annual tax of ten dollars for each automobile seating more than two and not more than seven, and $20 for each such automobile seating more than 7.

(S.) Paragraph K means that automobile hearses or ambulances operated for hire are not subjected to the tax referred to in Paragraph J.

Standard Metal Products Co., Rock Island, Ill., has been incorporated to manufacture automotive accessories. Richard Sybenga is president of the company; E. F. Dorn, vice-president, and R. M. Pearce, secretary and treasurer. The capital stock is $50,000.

Cleveland Truck Dealers' Association Doing Well

With practically every motor truck dealer or distributor in Cleveland in its membership, the Commercial Car Dealers' Association of Cleveland, is well along on its second year, and its monthly dinners and programs are becoming



Fred P. Brand, President Commercial Car Dealers' Association, of Cleveland

more and more a real feature in the business and social life of the members. Subjects discussed at recent meetings have been chosen with a view to helping the members meet their every day problems and much has been accomplished along this line.

At a recent meeting, H. B. Perkins, treasurer of the Packard-Cleveland Motor Co., spoke on "Credits," and a very spirited discussion was indulged in after the address, bringing up many ideas that



George K. Wadsworth, Secretary Commercial Car Dealers' Association, Cleveland

have since proved useful in handling sales. Thomas Caughlin, vice-president of the Morris Plan Bank of Cleveland, was another recent speaker along financial lines. He urged the development of some plan by which the Morris bank could assist truck prospects in financing their purchases. He advocated a closer relation of the banker and the truck dealer so that more liberal plans could be developed for handling time payments on trucks.

T. R. Dahl, chairman of the association committee on legislation, gave a very enlightening talk recently on the problems confronting motor truck dealers from the legislation standpoint, urging them to be on the alert to prevent adverse legislation which is threatened on all sides.

Both the Goodyear and Goodrich companies have shown moving pictures, accompanied by lectures, of their plants, the manufacture of tires, and other kindred subjects at these dinners.

The Cleveland association holds its monthly dinners and meetings at the Winton Hotel. The management extends the courtesy of furnishing cabaret from its regular program during the dinner hour. An average of 45 members at these meetings is the usual thing, as the subjects taken up are such that no member misses a meeting unless absolutely necessary. Dinner is set for 6 P. M., with the business program later.

The association was formed in the spring of 1918, with members paying $100 initiation fee and $15 per year dues. Fred P. Brand, Pierce-Arrow distributor, is president of the association; H. S. Norton, of the Packard Cleveland Co., is vice-president; George K. Wadsworth, GMC truck distributor in Cleveland, is secretary, and J. V. Mahoney, of the Ohio Nash Co., is treasurer.

Three New Members in Highways Transport Committee

WASHINGTON, August 4.—The appointment of three new members to the Highways Transport Committee of the Council of National Defence is in line with the plan announced recently to enlarge the committee by the addition of members from other branches of Government service.

The newly appointed committee members are: Lieutenant-Colonel J. M. Ritchie, of the Motor Transport Corps; John W. Hallowell, of the Department of the Interior, and Clifford Shumaker, of the Bureau of Public Roads. Mr. Shumaker succeeds John M. Goodall, whose resignation from the Bureau of Public Roads left a vacancy on the committee.

A special sub-committee of the Highways Transport Committee met on July 15 and discussed plans to complete the general fundamentals to be included in a course on highways and highway transportation, with special reference to automobile trucks, in universities and colleges. Details as to the length of the proposed course are left to the educational institutions to determine. The sub-committee reported that interest in highways and highway transportation has increased to such an extent that numerous colleges have already established courses of this nature. Among the colleges having a highway course at the present time are: Mississippi A. & M., Georgia Tech., Michigan Agricultural College and the Virginia Polytechnic Institute. It is also anticipated that commercial institutions, automobile manufacturing concerns and civic organizations will also establish such a course.

Motor Trucks Take the Crowds Home

CHICAGO, ILL., July 24.—On the first day of Chicago's street car strike over 250,000 workers and shoppers found themselves in a quandary as to how to get home after business hours. However, their anxiety was relieved in short order, and the motor truck once again proved its worth as the twentieth century transportation unit. Within a short time after the car strike was in full swing, hundreds of motor trucks backed up to curbs in the Loop district and the passengers seemed to find their way to them by instinct. Some of the big department stores and plants having a fleet of motor trucks promptly requisitioned these trucks into the passenger carrying service, and the trucks started in bright and early the following day bringing the crowds back again into the business district. It is said that less than twenty per cent. of those employed in the loop district were absent the following morning of the strike on account of transportation.

Annual Meeting of National Association of Motor Truck Sales Managers at Detroit

Members of the National Association of Motor Truck Sales Managers will gather at the Statler Hotel in Detroit November 7 and 8 in annual session, the July meeting of the association having been postponed on account of the motor truck tour now enroute under the auspices of the organization. Officers will be elected at the Detroit meeting and plans for the following year will be outlined.

Memphis Has Ship-by-Truck Demonstration

MEMPHIS, Tenn., July 23.—G. W. Richardson, president of the Richardson Motor Sales Co., has announced that fourteen Memphis dealers will take part in a tri-state ship-by-truck demonstration which will be opened in Memphis August 19. Mr. Richardson is chairman of the committee in charge of the demonstration and Elwood Lloyd, secretary of the Memphis Automobile Club, will be commander of all truck trains making demonstration trips out of the city.

The local ship-by-truck campaign will be carried into Arkansas, Mississippi and Tennessee. Truck trains loaded with shipments from Memphis houses will carry goods to buyers in nearby towns. The trucks will be accompanied by salesmen who will seek to show the value of the truck to the country merchant and to the planter for short hauls.

Personal Items

H. Powell Anderson has been made special representative of the Monarch Governor Co., Detroit, with headquarters in Detroit.

H. M. Bacon is now general sales manager for the McGraw Tire & Rubber Co. He will make Cleveland his headquarters.

Everett Betts, formerly general manager of the Stroh Castings Co., is now vice-president and general manager of the Production Castings Co., Ann Arbor, Mich.

J. C. G. Bradley has been appointed distributor of Bethlehem trucks at Syracuse, N. Y.

Lieut-Col. Will H. Brown, who has just returned from France, where he was in charge of all motor transport of base section 1, A. E. F., has been appointed supervisor of purchases and material for the Nordyke & Marmon Co., Indianapolis.

Glen Buck has been appointed advertising agent of the Rubber Products Company, maker of Stronghold tires and tubes.

Frank S. Caalendar, formerly a member of the engineering staff of the Studebaker Co., has been appointed general sales manager of the Modern Pattern & Machine Co.

L. B. Casagrande, formerly sales manager of the Available Truck Co., has recently been appointed sales and advertising manager of the Harvey Motor Truck Co., Harvey, Ill. Mr. Casagrande is now busily engaged lining up dealers on the new Pneumatic Speed Job just announced by the Harvey Co., which is described in this issue.

Thomas C. Cheasley, formerly works manager of the Springer Wire Wheel Corp., has been appointed eastern representative of the Monarch Governor Co., with headquarters in New York City.

P. C. Chrysler, formerly manager of the Philadelphia branch of the Hurlburt Motor Truck Co., has been appointed director of the wholesale department of Hurlburt Motors, Inc., a new company formed in New York City to take over the sale and distribution of Hurlburt trucks.

John Cleary has been made advertising manager of the Cadillac Motor Car Co., Detroit, succeeding Lee Burnett, who resigned recently.

Julian Gifford has been made treasurer of the Zenith Carburetor Co., Detroit, Mich.

Chas. Clifton has been elected chairman of the board of the Pierce-Arrow Motor Car Co. John C. Jay succeeds him as president of the company.

H. R. Cline, until recently special representative of the Globe Rubber Tire Mfg. Co., New York, has been appointed manager of the Chicago branch, having charge of the central territory, with headquarters at 2029 South Michigan Ave.

E. S. Cole has been appointed Canadian representative for the Traffic Motor Truck Co., St. Louis, Mo.

B. L. Combs has been placed in charge of the Oakes experimental laboratory by the Oakes Co., Indianapolis, manufacturer of radiator cooling fans.

George W. Daum has been elected assistant general manager of the Pennsylvania Rubber Co., Jeannette, Pa.

William C. Dudgeon has resigned his position on the advertising staff of the Campbell-Ewald Co. to accept a similar position with the Gardner Advertising Co., St. Louis, Mo.

W. W. J. Dukes, formerly associated with the Vacuum Oil Co., of Chicago, as engineer of the western section, is now with the Buda Co., of Harvey, Ill.

H. Wilfred DuPont has resigned as treasurer of the Pennsylvania Rubber Co., Jeannette, Pa., in favor of A. H. Price.

Miss Ruth Edwards has resigned as treasurer of the Bantam Ball Bearing Co., Bantam, Conn. She is succeeded by **Mrs. E. J. Schoonmaker.**

E. R. Gardner, who has been sales manager of the truck department of the Velie Motors Corp., Moline, Ill., has been appointed sales manager of both truck and passenger car departments.



C. J. Buckwalter
Who has been made president of the Ambu Engineering Institute, recently established by the American Bureau of Engineering, Chicago, Ill. This school will train specialists in automotive electrical repair work.

Colonel Fred Glover, formerly chief of the Motors and Vehicle Division of the War Department and later Assistant Director of Sales of the War Department, has been appointed assistant general manager of the Timken Detroit Axle Co.

Charles G. Guild has been made secretary and service manager of the Wayne Oil Tank & Pump Co., Fort Wayne, Ind., to succeed Clayton O. Griffin, who resigned recently.

Emlen S. Hare has resigned as vice-president of the Packard Motor Car Co., Detroit.

Raymond Hawley, who has recently been assisting in sales supervision of Biddle and Owen Magnetic cars in the states of Pennsylvania, New Jersey, Delaware and Maryland, has been made manager of sales and advertising for the Guaranty Motors Co., Cambridge, Mass.

E. T. Herbig, who has been both advertising and sales manager of the Service Motor Truck Co., Wabash, Ind., has been made sales director of the company.

W. B. Herendeen has recently been appointed assistant sales manager of the Ward La France Truck Co., Inc., Elmira, N. Y.

R. A. Hillstrom has been appointed city sales manager in St. Louis for the Traffic Motor Truck Co., St. Louis, Mo.

Wallace C. Hood has been appointed general sales manager of the Standard Motor Truck Co., Detroit, Mich.

Wm. B. Hurlburt has resigned as temporary receiver of the Hurlburt Motor Truck Co. Mr. Hurlburt intends to give his entire time to organizing the Hurlburt Motors, Inc., a selling organization formed in conjunction with the Harrisburg Mfg. & Boiler Co.

Waldemar H. Jacob has been made distribution manager of the Bearings Service Co., Detroit. He will have supervision of the entire service sales activities of the concern and will co-ordinate under his direction the work of both the sales and advertising departments.

Frank L. Johnson has been made manager of sales promotion of the Service Motor Truck Co., Wabash, Ind.

Langdon P. Marvin has been appointed temporary receiver of the Hurlburt Motor Truck Co., following the resignation of Wm. B. Hurlburt.

J. A. Massie, sales manager of the Hoyt Electrical Instrument Works, has resigned. He will continue to be identified with the organization through his interest in the Burton-Rogers Co., which has been made the sales department of the Hoyt Electrical Instrument Works.

Geo. H. Miller has resigned as superintendent of the milling division of the Reo



B. F. Kelly
Who is now in charge of the sale! of Weidely "Bulldog" motors for the Weidely Motors Company.



Harold J. Vogler
Who has recently been made general sales manager of the American Motor Truck Company, Newark, Ohio.



George G. Bailey
Who has resigned as sales manager of the Brown-Lipe Company to become general sales manager of Hinkley Motors Corporation, Detroit.



J. Albert McCollum
Who has been made advertising manager of the Traffic Motor Truck Corporation, St. Louis, Mo.

Motor Car Co., to accept the position of general superintendent with the Holt Manufacturing Co.

W. J. Munro has returned to his position with the Green-Fulton-Cunningham Co. Mr. Munro was assistant advertising manager for the G. M. C. truck.

O. J. Ridenour, until recently secretary and assistant general manager of the Wright-Martin Aircraft Corp., has become associated with the National Chain Co., New York City, as vice-president and general manager.

Professor L. F. Seaton, for the past several years in charge of the department of mechanical engineering of the University of Nebraska, has joined the staff of the Hebb Motors Co., Lincoln, Neb., as manager in charge of production.

Bartlett J. Smith has been appointed eastern district manager for the International India Rubber Corp., manufacturer of South Bend and Odell tires, with headquarters in New York City.

Walter W. Smith has been promoted to the position of assistant general sales manager of Nash Motors Co., Kenosha, Wis.

R. C. Spinning, formerly assistant manager of sales and advertising for the Service Motor Truck Co., Wabash, Ind., has been made advertising manager.

R. M. Stetson has been appointed Detroit representative of the Xardell Brothers Co., Utica, N. Y. Mr. Stetson formerly represented the Packard and Maxwell Companies in Detroit.

Frank A. Vanderlip, chairman of the board of directors of the American International Corp., has been elected a director of the United States Rubber Co., New York.

E. E. Vreeland, formerly treasurer of the Fulton Motor Truck Co., and more recently a member of the Abbott-Downing Co., Concord, N. H., has sold his interest in the latter concern and is now at the head of the Vreeland Motor Co., Newark, N. J., with offices at 71 Wall St., New York. Mr. Vreeland will manufacture 1, 1½ and 2½-ton trucks.

Walter C. White, vice-president of the White Co., Cleveland, Ohio, has been made a chevalier of the Legion of Honor by the French Republic. This honor was conferred in recognition of the service rendered to France by the White Co. during the war.

Factory News

The Oliver Rim Co., Atlanta, Ga., a $1,000,000 concern, has recently been organized. It will manufacture a split, demountable rim.

Moreland Truck Co., Los Angeles Cal., is planning the erection of an addition to its plant. A branch plant will also be erected at Fresno, Cal.

Marx Trailer Co., San Diego, Cal., formerly the California Trailer & Radiator Co., is being incorporated for $200,000. This company has been manufacturing light commercial trailers for three years.

Cushman Auto Tool Co., Champaign, Ill., announces that it has completed arrangements for additions to its plant and equipment which will more than double its capacity. The name of the company is to be changed to the Cushman Co., Inc., as the original name is no longer descriptive of their activities. There will be no change in the management or personnel of the company. O. H. Hyde, president of the Western Tool & Mfg. Co. and of the Safety Emery Wheel Co., both of Springfield, Ohio, has recently purchased an interest in the company and will be made a director.

Detroit Pressed Steel Co., Detroit, announces the acquisition of the Carlton Ave. plant of the Detroit Shell Co. This addition comprises 167,200 sq. ft. of floor space and includes an office building, a one-story brick dry kiln and a main building. With this increase in facilities it is planned to speed up production of Disteel Wheels, as the new buildings will be turned over entirely to the Wheel Division of the company.

Fruehauf Trailer Co., Detroit, Mich., has purchased a five-acre tract of land for the erection of a new plant. Plans are now under way and it is hoped to have the plant ready for occupancy in the fall. An increase in the capital stock from $150,000 to $250,000 is also planned.

Clark & Stebor Rubber Co., Inc., Plainfield, N. J., has recently purchased a factory and will begin in September the manufacture of the C. & S. blow-out patch and red inner tubes.

Simms Magneto Co., East Orange, N. J., has recently closed a contract for the addition to its plant of a concrete building, 152 ft. long by 66 ft. wide. The walls of this building are to be made sufficiently strong for the carrying of three additional stories to take care of future expansion. Orders have been placed for the necessary equipment and automatic machinery. It is expected that the work will be complete in 90 days.

The General Motors Co., New York, N. Y., has purchased a site, valued at $750,000, in St. Louis, Mo. They plan to erect a $5,000,000 plant here for the production of Buick and Chevrolet cars.

B. F. Goodrich Rubber Co., Akron, Ohio, is planning to erect a large eight-story building to replace the buildings in the group formerly occupied by the American Hard Rubber Co. The building will cost $1,500,000 and construction and equipment will be of the most modern type.

Rubber Products Co., Barberton, Ohio, announces that it has in process a manufacturing program which will double their output within 30 to 60 days.

Lunkenheimer Co., Cincinnati, Ohio, manufacturer of valves and engineering appliances, has announced plans for the construction of a new plant. The site on which the new plant is to be erected comprises about seventy acres of land in Carthage, a suburb of Cincinnati. The undertaking will represent an outlay of approximately $2,000,000.

The Trailmobile Co., Cincinnati, Ohio, is erecting new factories at Oakley, Ohio.

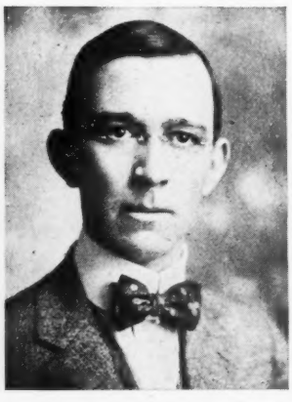
Mason Tire & Rubber Co., Kent, Ohio, has taken steps to acquire several thousand acres of rubber plantations in the Far East. These will comprise plantations sufficient to fill the company's requirements next year. Partially developed lands will provide for future increase of business. It is proposed to build in Kent a large concrete warehouse exclusively for rubber storage. J. P. Matthews, now purchasing agent of the Mason Tire & Rubber Co., will assume the management of the Mason Plantation Co. The Mason Housing Co. has recently been incorporated for $100,000 to provide proper living conditions for the additional employees necessary when the recently announced factory extensions are completed.

United States Motor Truck Company Holds Annual Meeting

The annual meeting of the United States Motor Truck Co. was held at the factory on Monday, July 21. The regular one and one-quarter per cent. quarterly dividend on the preferred stock was declared, together with a seven per cent. dividend on the common stock.

The report of the management regarding production showed the present commercial output to be more than double what it has been heretofore.

At the election all the old officers were re-elected and the board of directors was increased by three new members as follows: R. J. Firestone, E. C. Shumard, W. H. D. Totten.



D. B. Cooper

Who has been made divisional sales supervisor of the Four Wheel Drive Auto Company, with headquarters at Denver, Colorado.



Walter J. Roseberry

Who has been placed in charge of special sales and promotion work at the Minneapolis section of the Oliver Chilled Plow Works.



Earl L. Vosler

Who has been elected secretary of the Fruehauf Trailer Company, Detroit. Mr. Vosler has been sales manager of the company for the past two years.



Lieut. J. Lowcher

Recently discharged from the service, who has been appointed head of the accounting department of the Eisemann Magneto Corporation, Brooklyn, N Y.

The Perfect Rubber Co., Mansfield, Ohio, has begun work on its buildings. John H. Link, formerly chief chemist for the Faultless Rubber Co., of Ashland, is connected with the new concern.

The Milburn Wagon Co., Toledo, Ohio, has added 40,000 sq. ft. of floor space to its factory.

Autocar Co., Ardmore, Pa., announces that its stockholders, at a recent meeting, voted to increase the capital stock of the company from $2,000,000 to $10,000,000. This issue of stock is for financing the increasing business of the company. The Autocar Co. wishes to announce that there is no foundation for rumors to the effect that the company is preparing to consolidate with other motor truck interests.

Cole Storage & Battery Co., Philadelphia, Pa., announces that it has completed improvements to its new factory addition, which give the company 14,000 sq. ft. of additional floor space. This factory addition is located at 2435-41 Indiana Ave. Ground has been purchased for the erection of a new building in the near future.

Reliance Motor Truck Co., Appleton, Wis., announces an increase in the capital stock of the company from $500,000 to $1,000,000. Construction of a new building which will triple the capacity of the plant has been authorized by the board of directors of the company. The addition will be 70 ft. wide by 300 ft. long and three stories high.

Helgeson Foundry Co. has been organized at Green Bay, Wis., to engage in the manufacture of gray iron and steel castings. The company proposes to build and equip a plant costing $100,000. The company has been organized by Andrew Helgeson, A. L. Cannard, William Hoberg, Charles H. Greilling and A. W. Gregg.

New Agencies

Galesburg Overland Co., Galesburg, Ill., has taken the agency for Republic trucks in that territory.

Perfection Sales Co., Peoria, Ill., recently incorporated with a capital stock of $500,000, will distribute Perfection asbestos tires in Illinois, Missouri, Idaho and Iowa.

Jones Motor Sales Co., Sioux City, Ia., has recently been organized to sell automobiles, trucks and tractors. They will have a salesroom on Pearl St.

Republic Motor Co., Alma, Mich., announces that it will open a branch at London, Ont. For this purpose a $500,000 building will be erected. A. C. Smith, of Toronto, will be general manager.

McGee-White Corp. has recently been organized at Minneapolis, Minn., to distribute the Field line of bodies for commercial cars in the Northwest. Temporary headquarters will be at 911 Hennepin Ave. The officers of the company are: J. J. White, president; A. N. Paulsrud, vice-president; L. Leren, secretary, and R. B. McGee, treasurer and manager.

Polack Tyre & Rubber Co., New York City, announces the appointment of the following distributors of Polack truck tires: Tire Sales Co., 204 St. Paul St., Baltimore, Md.; Barnard-Michael Tire Co., 908 Main St., Buffalo, N. Y.; Geo. L. Carroll Co., 719 N. Broad St., Philadelphia.

Mason Tire & Rubber Co., Kent, Ohio, has opened a branch at 450 Jackson St., Milwaukee, Wis. E. E. Gessert has been appointed branch manager.

Removals and Trade Changes

The Don Lee Coach & Body Co., Los Angeles, Cal., which was organized recently, has purchased the Earl Automobile Works. The plant is to be enlarged and, when completed, will be one of the largest body-building plants in the country.

K. & W. Rubber Co. of Colorado, announces that the firm name has been changed to the E. W. Ohls Rubber Co.

Alemite Metals Co., Chicago, Ill., announces that in the future the company will be known as the Alemite Die-Casting & Mfg. Co. The change is deemed advisable to more fully cover the company's scope of activities which have changed from exclusive die-casting to die-casting and manufacturing.

Parker Collapsible Rim Corp. announces its removal to 605 Westminster Bldg., Chicago, Ill. This company recently elected a new board of directors. J. H. Hunt is president of the company and W. H. Sickinger, general manager.

J. T. Stewart Motor Co., Sioux City, Ia., distributors of Mitchell and Pierce-Arrow cars, is about to move into its new building at 505 Pearl Street.

Detroit Trailer Co., Detroit, has moved to 27-37 Jos. Campau Ave., where it will have increased manufacturing facilities.

The General Motors Co., New York City, has recently let a contract for the construction of a foundry at Janesville, Wis. This will be a part of the Samson unit of the company and will be used for building parts for the Model M Samson tractor.

National Wire Wheel Works, Inc., manufacturer of Pasco wire wheels, is now occupying its plant at Hagerstown, Md. The general offices of the company have been moved from Geneva, N. Y., to the Book Bldg., Detroit, Mich.

Simplicity Wheel Company has removed to 710-712 Monroe Avenue, Grand Rapids, Mich.

Jackson-Church-Wilcox Co., Saginaw, Mich., now a unit of General Motors, has changed its name to the Saginaw Products Co., and has included in its manufacturing organization the Jacox steering gear plant, the engine plant and the Dentral foundry.

Auburn Ignition Mfg. Co., Inc., announces that it is removing its plant from Auburn, N. Y., to Richmond, Ind., where it has secured manufacturing facilities which will enable the company to turn out 20,000,000 spark plugs a year. The capital of the company has been increased to $200,000.

Watson Wagon Co., Canastota, N. Y., announces that its name has been changed to Watson Products Corp.

The American Motor Truck Co., New York, N. Y., has bought the plant of the Portland Manufacturing Co., Portland, Conn. The company plans to manufacture motor trucks of all sizes.

J. H. Faw, Inc., New York City, manufacturer and distributor of automobile accessories, announces its removal from 37 Warren St. to 27 Warren St.

Fulton Motor Truck Co. announces the removal of its general offices and sales department from the factory at Farmingdale, L. I., to 1710 Broadway, New York City.

McJunkin Advertising Co. announces the removal of its New York offices from the Astor Trust Bldg., 501 Fifth Ave., to 450 Fourth Ave.

Savold Tire Corp., New York, N. Y., has concluded arrangements with the Finance and Trading Corp., whereby the latter company will hereafter assume the international management and control of the Savold tire business. The new interests will also supervise the general operation and business of the various state Savold Tire companies. The officers of the Finance and Trading Corp. are: E. R. Duer, president; Otis A. Glazebrook, Jr., vice-president and treasurer; Edward S. Moore, Horace W. Davis and Oliver S. Lyford, vice-presidents.

Wedgrite Piston Ring Co. announces the removal of its office from Detroit to Plattsburg, N. Y.

Loyal Motor Truck Co., manufacturer of ¾- and 1-ton Loyal trucks, announces that its new address is 217-218 Marine Bank Bldg., Erie, Pa.

Metal Products & Supply Co. announces its removal from Philadelphia to Lansdowne.

Reflex Ignition Co., maker of Reflex spark plugs, announces its removal to its new plant on West 106th St., Cleveland, Ohio. The removal was made necessary by the rapid expansion of the company's business.

The Automotive Corp., manufacturer of farm tractors, announces the removal of its general offices from Fort Wayne, Ind., to 403 Madison Ave., Toledo, Ohio. The present factory of the company is located at Napoleon, Ohio, but will begin construction of plant at Toledo during the summer.

Tri-State Accessories Corp., with headquarters at 425-27 West San Antonio St., El Paso, Texas, has taken over the Tri-State Motor Co., the Western Motor Supply Co. and the Yonge Auto Supply Co. and will operate as a wholesale automobile accessory house. Officers of the organization are: Barry Cool, president and general manager; J. W. Kirkpatrick, vice-president; Charles Montfort, secretary and treasurer.

The Fulton Co., Milwaukee, Wis., is planning a new plant in West Allis, a suburb of Milwaukee. The factory is to be of brick.



Enthusiastic Sales Convention at Plant of Sewell Cushion Wheel Company

Above is pictured the entire sales organization and executives of the Sewell Cushion Wheel Company gathered at the recent sales convention held in Detroit, characterized by W. T. Sewell, treasurer of the company, as "the most enthusiastic, result-producing gathering we have ever had."

EFFICIENT REPAIR METHODS

Editor's Note: This department is conducted primarily for the new repairman and dealer; also the repairman in the smaller towns who is anxious to place his shop on a better paying basis and do his work in a more systematic manner. We shall appreciate any suggestions or criticism that will help us make this department satisfy your needs.

Instructions for the Care and Repair of the Clark Internal-Gear Drive Axle

THE object of this article is to explain to repairmen how the repairing and adjustments on the Clark axle may be done in the most efficient and easiest way. A brief description of the axle might help those who are not well acquainted with it.

The Clark axle is of the internal gear drive type. It is composed of two major assemblies; a load carrying unit on which the wheels are free to rotate, as on a chain drive axle, and a driving unit. This driving member is fastened to the load carrying member, and drives the wheels through a small spur pinion which meshes with a large internal gear that is fastened to the wheels. The driving assembly is made the same as a regular axle under a passenger car, except that the spur pinions take the place of the regular road wheels.

The care and repair of these axles is considered in the following order: The replacement of broken parts, the relining of the brakes, the removal of the differential, the adjustment of the gears and bearings, and the lubrication of all parts.

In the Clark axle the load carrying member is a solid bar, the ends of which are formed into the wheel spindles. Malleable iron spring pads, which also form supports for the brakes and drive shaft housing, are pressed on over the ends of the bed. There is no positive fastening between the bed and pads, and if a pad is broken it may be driven off, but a press is necessary to put the new one on. In replacing a pad be sure that the spring seats are both level. If the new seat tips a little the bolt holes for the drive shaft housing will not line up with those in the housing.

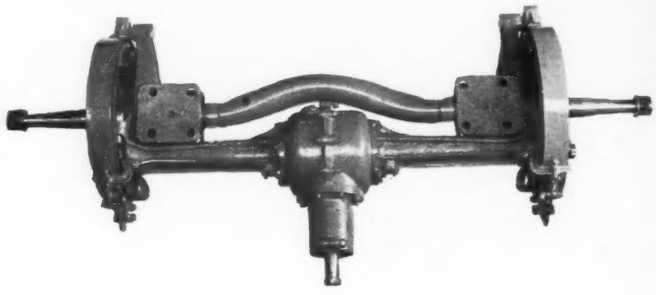


Fig. 1. The Clark Two-Ton Internal-Gear Drive Truck Axle.

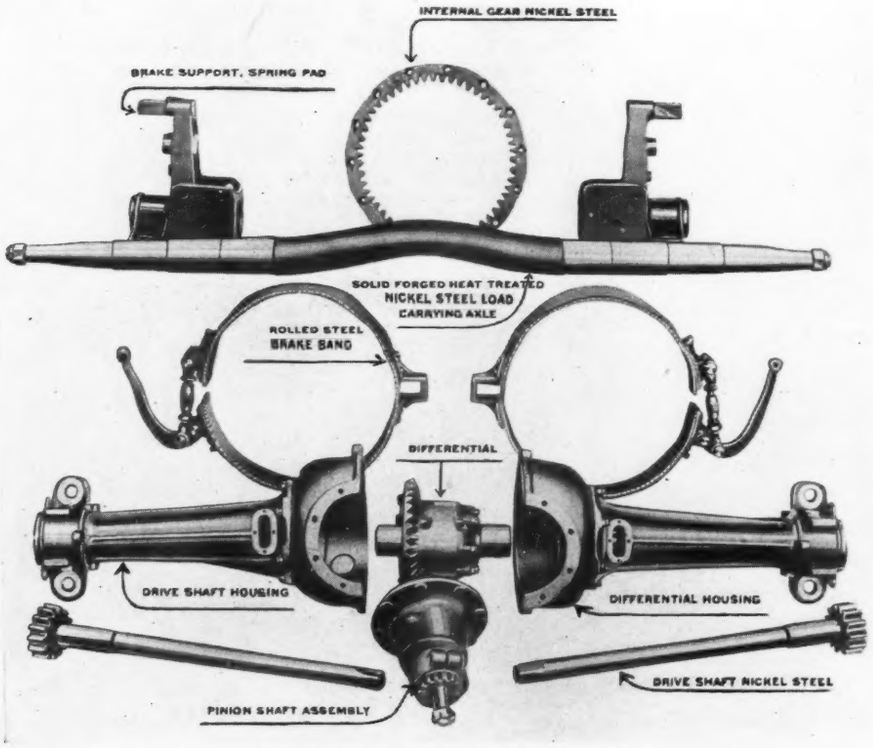


Fig. 2. Major Assemblies of the Clark Axle

Relining Brakes and Inspecting Gears

If it is necessary to reline the brakes or replace or inspect the wheel bearings or internal gear and pinion, the wheel must first be removed. To take off a wheel, first take off the hub cap by unscrewing the six cap screws in it. Unscrew the nut on the end of the spindle with a socket wrench. If no socket is handy, take off the slotted collar that is around it by unscrewing it with an old spring leaf or screw driver. This collar holds the outer bearing in the wheel. After the collar is out of the way, the nut may be taken off with an open end wrench. The outer wheel bearing is an annular ball bearing, and as it is a tight fit on the spindle it is often necessary to use a wheel puller. The inner bearing is a straight roller bearing. With the older types of axles, which have screwed on hub caps, a special wheel puller is furnished. In using this puller, screw it all the way on the hub, and then tighten up the set screw in it with a wrench. If the wheel sticks, hit the set screw a sharp rap with a hammer. With the new types of axles, having the bolted on hub caps, no puller is furnished, as any puller

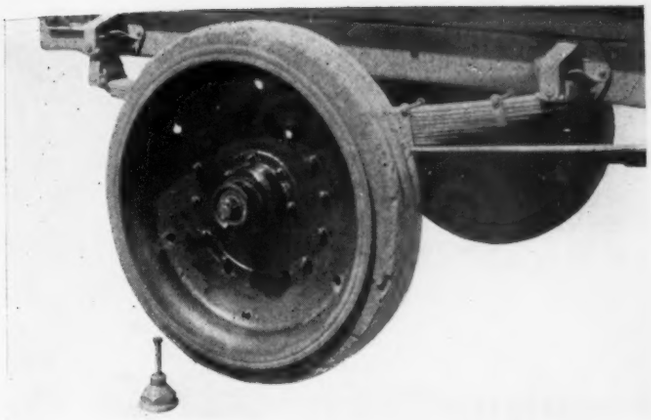


Fig. 3. Method of Removing a Wheel

held in place by a key and nut. The bearing just in back of it is a Hyatt roller type, while the one nearest the universal is a double row annular. To remove the pinion, loosen the nut, pry on the pinion, and at the same time tap the end of the shaft. After the gear is loose, unscrew the nut, and it will clean up any

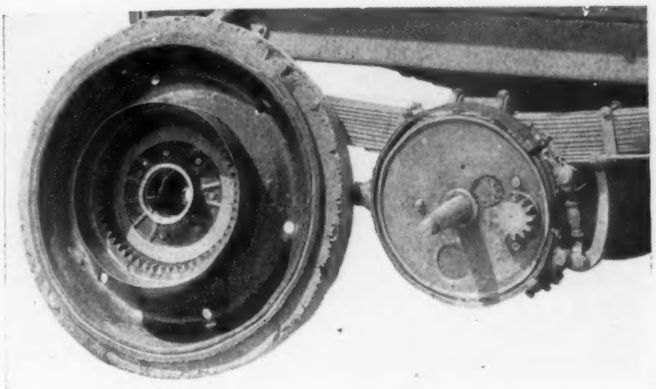


Fig. 4. Driving Mechanism of the Clark Axle

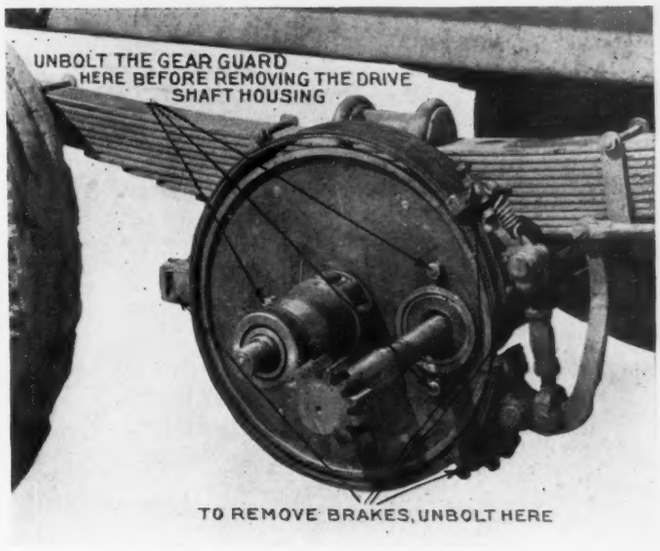


Fig. 6. Preliminaries for Removing the Brakes



Fig. 5. Drive Shafts Removed

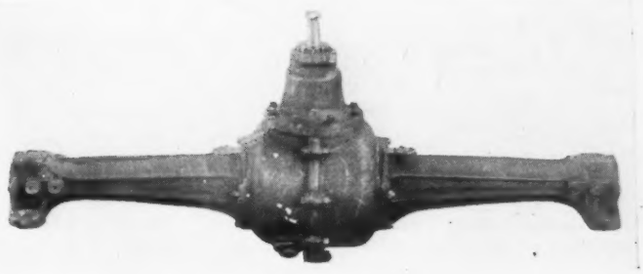


Fig. 7. The Driving Assembly Removed

may be used by hooking it in back of the hub flange. After the wheel is off the outer bearing may be driven out from the rear. (See Fig. 3.)

With the wheel off, the internal drive pinion and shaft may be pulled out. (Fig. 4.) In the earlier axles the pinion and shaft were made in one piece. In case one breaks, both must be replaced. In the newer axles the gear is made separate. The outer end of the drive shaft is broached with six keyways, and the gear is held on it by a thin hex. nut. The two internal pinions and the drive shafts are the same, that is, they are not right and left.

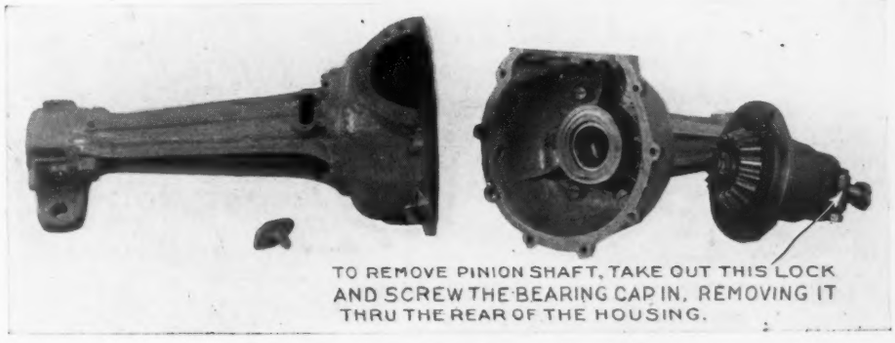


Fig. 8. The Drive Shaft Housing Members

Rear Axle Driving Members

All adjustments on the Clark axle may be made while it is in place, but, if the ring gear or any of the differential parts need replacing, the whole drive shaft assembly must be taken down. To do this after the wheels are off and the drive shafts removed, take off the brakes and internal gear dust guard by removing the bolts as shown in Fig. 6. Unbolt the ends of the drive shaft housing from the spring pads, drop the propeller shaft, and the assembly may be carried away. The assembly is shown in Fig. 7. Unbolt the pinion shaft assembly, and then the differential housing. Pull the housing apart and the differential will fall out. (See Fig. 8.)

Bevel-Drive Pinion Adjustment

If the drive pinion needs attention, the pinion shaft assembly may be removed while the axle is under the truck. The pinion is a taper fit on its shaft and is battered threads that may have formed. To get at the forward bearing, screw the bearing cap at the universal joint end of the shaft all the way in, as it is assembled through the rear of the housing, after which the collar that holds the bearing in the cap may be removed.

Adjustments

Driving Gears. Although the wear of the rear axle bevel gears is slight, provisions for the adjustment of these gears



Fig. 9. How to Adjust the Differential Ring Gears

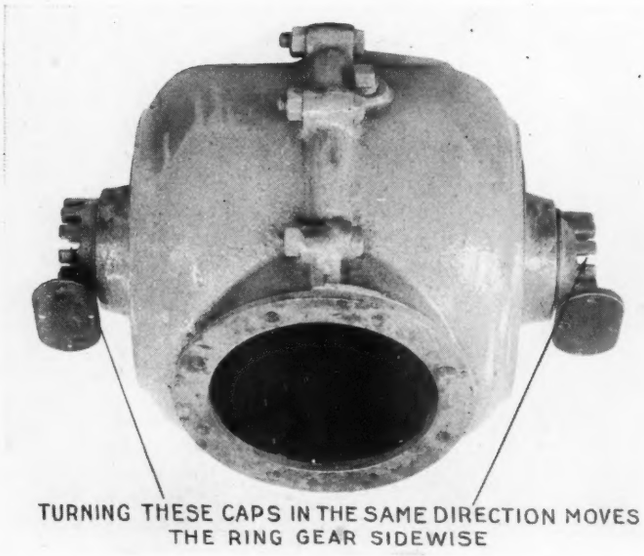


Fig. 10. A Close-up View of the Ring Gear Adjustment

will move sidewise. The locks for these bearings are on the under side of these covers.

Wheel Bearings. The ball bearings on the outer end of the spindles take the side thrust, and when turning corners the inside wheel takes all the thrust. The only attention that these bearings need in the way of adjustment is to see that the nut on the end of the spindle and the collar which is around it are kept tight.

Internal Gears. There is no adjustment provided for the meshing of the internal gears and their pinions. They must be replaced when they become badly worn.

Lubrication

The internal gears should be lubricated every 500 miles, and all other parts every 1000 miles. To grease the wheels, they



Fig. 11. Lubricating the Internal Gears

have been made, as it is important to keep them in the proper mesh to get the most service. Ordinarily the wear is taken up by moving the drive pinion and its shaft, to which it is keyed, into closer mesh with the ring gear. To do this, take hold of the rear half of the universal joint, and turn it back and forth to note the back lash in the gears. It should not be more than 1-64 in. If it is more than this remove the lock in the bearing cap just in back of the universal joint, and screw the cap in until the back lash has been reduced to the proper amount—1-64 in. Do not set them any closer than this. (See Fig. 8.) When the adjustment is correct the adjusting cap must be turned so that the lock fits into one of the slots in it.

The ring gear is mounted so that it can be moved sidewise when necessary. This adjustment is provided so that the large ends of the pinion teeth can be brought flush with the large ends of the teeth on the ring gear. This adjustment is used only when new gears are installed. To adjust, after removing the two adjustment lock covers at the sides of the pinion shaft housing, unscrew the bearing cap on the side toward which the gear is to be moved. When the cap on the other side is screwed in, the gear must be taken off and the hubs packed with grease. The internal gears should have about a handful of heavy grease. Apply it through the handhole on the inside of the guard, and smear it on the gear. (See Fig. 11.) The outer end of the drive shafts run in Hyatt bearings, and should get a gun full of heavy oil at each oiling. Squirt it through the holes near the ends of the housings, after removing the pipe plugs. Pour heavy oil into the differential case until it comes up to the oil level plug, which is in the side of the case. Every 2000 miles drain out the old oil in the case, flush it out with kerosene, and refill with fresh oil.

New Orleans Firms to Consolidate

NEW ORLEANS, LA., Aug. 7—The Abbott Automobile Co. and the W. P. Parkerhouse Auto Co. have consolidated with the addition of $50,000 new capital and a large amount of territory. The new company will distribute Packard cars and trucks and Franklin and Chandler cars.

The officers of the new company include James L. Wright, chairman of the board; F. P. Breckenridge, president; G. Abbott, vice-president and treasurer; W. P. Parkhouse, vice-president and secretary, and Palmer Abbott, vice-president.

The company will occupy the quarters of both the former companies until the service station, salesroom and repair plant, which they have been planning to erect some time tnis fall, is completed.

Appoints New Directors

DETROIT, MICH., July 30.—Directors appointed at the annual meeting of the stockholders of the J. C. Wilson Co. include J. C. Wilson, S. C. Wilson, C. E. Curtis, E. D. Hand, W. L. Murdock, W. H. Witt and Chas. Noble. The following officers were elected: J. C. Wilson, president; E. D. Hand, vice-president; S. C. Wilson, secretary and treasurer.

Lycoming Foundry & Machine Co., Williamsport, Pa., has begun the construction of a large addition to its factory. The addition will enable the company to double its output.

Acme Employees Enjoy Outing

CADILLAC, MICH., July 21.—The second annual picnic of the employees of the Acme Motor Truck Co. was held Saturday, July 19, 1919, on the banks of Lake Mitchell, near Cadillac.

The "doin's" commenced at nine o'clock, when the families of the employees were taken to the picnic grounds in Acme trucks. An old-fashioned, un-Hooverized picnic dinner was served on the grounds. Then came a full afternoon of water sports of many kinds.

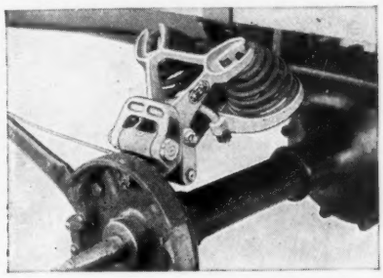
The Acme Co. officials have arranged for a Field Day meet at Recreation Park to be held in the fall, and the picnic in July and Field Day in September or October will be made regular events.

TRUCK EQUIPMENT AND APPLIANCES

Hassler Shock-Absorber for Ford One-Ton Truck

Robert H. Hassler, Inc., Indianapolis, Ind., is manufacturing a shock absorber designed exclusively for Ford one-ton trucks. This absorber is identical in principle with the one made for Ford passenger cars, embodying a braced conical spring similar to the passenger car shock absorber.

The shock absorber is attached to the front axle where the regular Ford spring ordinarily is shackled. The end of the



Hassler Shock-Absorber Attached
This illustration shows the model for the rear of the Ford one-ton truck

Ford spring is shackled to the lever extending from the conical spring casting to the front axle, supporting the leaf spring in such a way that when the conical spring closes, the lever yields downward. The conical spiral spring being sensitive, takes up the jolts and jars. The natural downward motion of the leaf spring is not interfered with or hampered. All the original range of the leaf spring is added to that obtained from the conical spring.

The upward toss of the leaf spring is modified by an extension of the lever. This extension engages with the axle at the time of the upthrow, holding the lever stationary, and, through the compression of the conical spring, holds the spring leaf down.

The rear is fastened in the same manner. The construction of the rear absorber, however, is much heavier than that of the ones used at the front, to withstand the greater strain of carrying the load. Also, an added ability to cushion the heavier shocks is provided through the use of dual coil springs instead of a single spring.

The shock absorbers may be applied in a short time by anyone familiar with automobiles. There is no cutting or drilling to be done.

Polack Tyre & Rubber Co., New York City, announces that it has extended the adjustment basis on Polack Regular truck tires to 10,000 miles and on Polack High Crown truck tires to 12,000 miles.

National Non-Pneumatic Wheel

The National Auto Wheel, manufactured by the National Auto Wheel Corp., Wausau, Wis., is designed to serve in place of the pneumatic tire on light commercial cars and trucks. Resiliency is obtained by rubber air cushions.

The National non-demountable type is constructed as follows: Channel, with the rim projecting and partly covering the rubber cushion, is secured to the felloe of the inner wheel. In the center of this channel sixteen dowel pins extend into radial holes in the cushion. This arrangement provides a driving connection between the channel and the cushion material to a similar but detachable channel rim, projecting inward and partly covering the cushioning, also provided with sixteen dowel pins.

The projecting edges of both channel rims are cut into a series of indentations, being placed in such relative position that the raised edges of one rim are free to vibrate within the indentations in the other rim, thus securing the rubber cushion between the two channels, without a complete metallic contact. The nature of this construction is somewhat



The National Resilient Wheel
This non-pneumatic wheel is adaptable to light commercial cars

similar to the working principle of two gears, except that there is no contact between the meshing teeth.

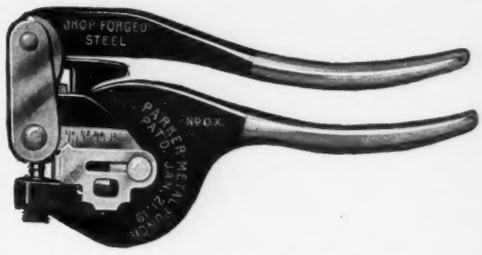
The detachable channel rim is secured to the clincher by sixteen driving pins held in place by the tension to the tire.

The demountable wheel is of the same general construction, the only difference being that it is made to fit the standard demountable rims instead of being permanently built onto the wheel.

It is claimed that this wheel lowers tire cost per mile, and eliminates a great deal of the tire trouble incident to the use of pneumatics.

Metal Punch for General Use

The latest addition to the line of the Parker Supply Co., New York City, is an improved sheet metal punch designed for field and shop work. It is known as the Parker metal punch No. OX. This hand punch is made of forged steel, heat-treated. The working parts are hardened and tempered. The combination of the front pointer and side gage is a new feature that eliminates the necessity for center punching or registering the center of the punch by looking into the throat. The new side gage also acts as



Parker Metal Punch
A drop-forged steel too made for general use in the garage and shop

a wrench for the removal of punches and as a screw driver for the replacing of dies.

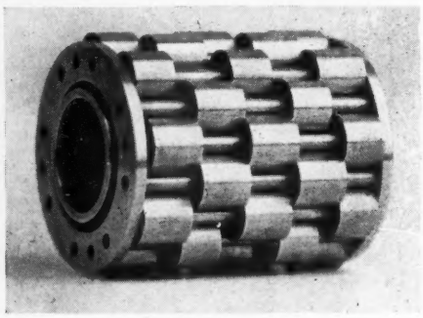
The length overall is 8 in., weight, 2⅝ lb., and the depth of the throat to the center of the punch is 1½ in. Standard size dies are made ranging from ⅛ in. to 17-64 in., claimed to punch holes in 16-gage steel. The retail price of metal punch No. OX is $7, including one punch and die. Extra punches and dies can be obtained for $.25 and $.35 each, respectively.

New Roller Bearing Has Staggered Rollers

A new roller bearing is being manufactured by the Hart Roller Bearing Co., of 25 Main St., Orange, N. J. In this bearing staggered rollers are substituted for those of the usual straight type. This arrangement permits the use of rollers of two different widths, arranged with staggered ends in assembly and meshed, covering the entire surface of the shaft and outer casing. The rollers are mounted on alignment shafts, supported at the ends by retainer rings in which they revolve freely. The staggered arrangement of the rolls effects a substantial reduction of the bearing angle, that is, the angle included between radial lines drawn from the axis of the bearing through the centers of adjacent rollers. This is stated to relieve the bearing of a large part of the strain to which it would

otherwise be subjected. The staggered arrangement also allows freer passage of oil and grease. The bearing can be arranged for operation in either a horizontal or vertical plane.

The maker states that the end of any roller which is light loaded is free to rotate independently of the heavily loaded end; thus the objectionable features



Hart Roller Bearings

It is claimed that the staggered arrangement of the rollers makes the bearing strong and provides freer circulation for oil or grease.

resulting from eccentric loading of the bearing are overcome. This bearing is made from a special compound of chrome-vanadium steel, carefully heat-treated. The bearing parts are all precision machined and accurately ground.

Maxotire Inner Tube Protector

The Maxotire is a product to reinforce the automobile tire. The construction is somewhat similar to that of a tire, the carcass consisting of layers of tire fabric and a tread of tough, wear-resisting rubber. The material used is designed to withstand the tube pressure until the outside shoe is worn practically to the Maxotire.

To prevent the sides from pulling up or blowing out under strenuous circumstances, one edge of the Maxotire is made like a straight side tire, having an endless steel hoop laid in it arranged to



Cross Section of the Maxotire Casing Liner, Which Protects the Inner Tube.

conform to the rim. The opposite side of this device is lengthened so as to extend over between the tube and rim and taper around under the hoop of the other side, thus completely encircling the tube. This extended flap, like the body, is semi-cured by a patent process. This feature is claimed to make it soft and form a non-chafing bed for the inner tube. The endless steel hoop tends to press into this soft flap, preventing slipping. The maker states that the rubber layer that covers the tread surface adheres to the tire, thereby preventing friction.

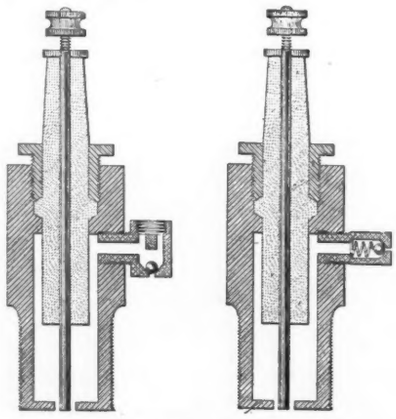
These reliners may be obtained from the manufacturers, the K. & W. Rubber Co., Ashland, Ohio, for any size ranging from 28 x 3 in. to 39 x 6 in. The retail cost ranges from $4.40 to $16.

The Northwind Ventilated Spark Plug

A new spark plug, the Northwind, has been placed on the market by the Cammen Laboratories, New York City.

In action, the spark plug resembles a priming plug, with this difference; instead of a priming cup, a little ball-check air valve is provided. In addition to this the usual side wire electrode is replaced by a washer with a hole through which passes the center electrode.

During the suction stroke the atmospheric pressure forces the ball back and air is admitted to the inner chamber of the plug. This is said to cool the porcelain and the central electrode and to blow out any oil that may have reached



Northwind Ventilated Spark Plugs

The left sectional view shows the vertical type of plug; the right, the plug used when it is not in vertical position.

the electrodes. Carbon formation on the plugs, it is further claimed, will be reduced.

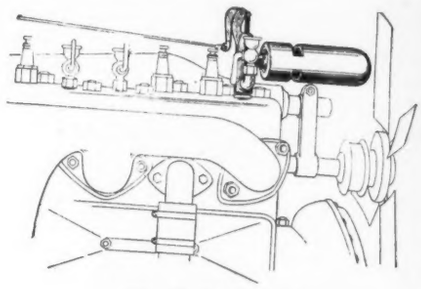
It is believed that the use of these plugs will materially assist in lessening pre-ignition and also afford protection against fouling.

This spark plug is produced in three sizes, ½-in. standard, ⅞-in. standard and ⅞-in. Buick.

Bailey Compression Signal Whistle

The Bailey compression whistle is a signalling device that is blown by the compression of one cylinder of the engine. It is inserted in the priming cup opening or attached to spark plugs having a priming cup. In attaching to engines where the spark and plugs and priming cups are together, a standard ⅛-in. elbow replaces the priming cup. The operation is directly from the steering post or dash.

An additional feature, by which an alarm is given if anyone other than the owner attempts to drive the car, is a movable wedge ring. This ring, to be brought into the alarm position, is slid upward over the elbow of the lever when the engine is stopped. The ring in this position is wedged between an extension of the valve body and the lever arm, causing the arm on the other side of the fulcrum to maintain a constant pressure on the valve spring, thus keeping the



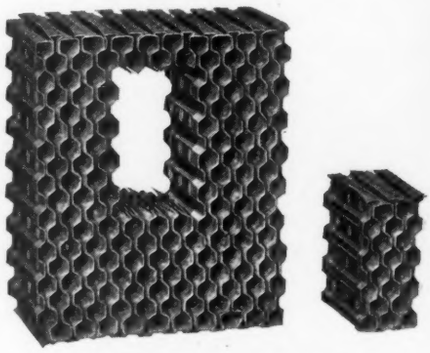
The Bailey Signal

Operates from the compression of one cylinder and can be locked open to give warning of unauthorized use of the car.

whistle open. Any movement of the engine will consequently result in a warning. The W. J. Bailey Co., Newark, N. J., guarantees this device to last during the life of the car. It retails for $4 complete.

Wabash Honeycomb Radiators

After many years of experience and consideration of various details in the construction of radiators, the Wabash Auto Radiator Mfg. Co., Inc., 1117 S. Wabash Ave., Chicago, Ill., has developed the Wabash Honeycomb Radiator. The company states that one of its main features is the great cooling capacity, made possible by the arrangement of corrugated brass sheets, these forming corrugated or zig-zag channels for water. Brass is used since the maker considers it the best for automobile work and each



Wabash Honeycomb Radiator Core

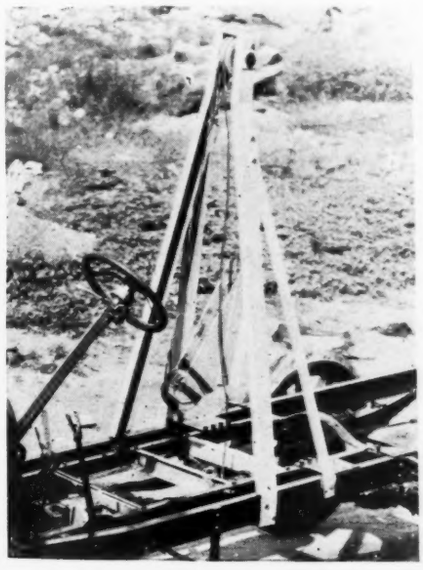
channel is made of only one layer of brass. The water channel contains small pockets or cells, increasing the water capacity considerably and also increasing the distance which the water must travel. The water thereby is held in the radiator for a prolonged period, during which it must come in contact with the radiator surfaces and is therefore more thoroughly cooled.

The Guaranty Power Hoist

The Guaranty Motors Co., of Cambridge, Mass., well known manufacturer of Guaranty units and power hoists, has made recent improvements in the latter product. This hoisting attachment can be put to a variety of uses, such as running a concrete mixer, traveling pump for oil companies, and other jobs too numerous to mention.

It consists of a cast steel housing in which are incased the chrome nickel steel gears and shafts which fasten to the rear of the Ford transmission. Extending out of this housing is a shaft with a drum on the rear end. To this a cable is attached. This cable winds up in connection with an upright channel steel "A" beam on which are pulleys. A ratchet on the drums holds the body at any raised position.

The operation of the hoist is simple. The Ford brake lever is placed in a neutral position and the hoist lever pushed forward, breaking the drive to the Ford rear wheels. Then upon pressing down the low speed pedal, the power is directed through the hoist to the pulley and cable, and the body raised to its unloading position. The reverse pedal is used to lower it. This hoist can be attached to any truck having Ford power plant, including Ford 1-ton worm drive truck.



The Guaranty Power Hoist

It is here shown in position on a Ford car equipped with a truck attachment. This power hoist has been improved in many ways, and the internal gear method of driving the power hoist is now employed in place of the dog and clutch method.

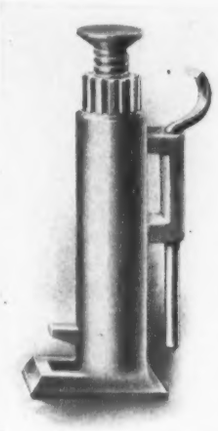
The dog and clutch means of driving the power hoist has been discarded and the internal gear method is now used. The accompanying illustration gives an excellent view of the outfit in position.

Fuller & Sons Mfg. Co., Kalamazoo, Mich., announces the opening of a New York office at 222 American Circle Bldg., 1834 Broadway, to handle its trade in the eastern section of the country. F. Geo. Walker is in charge.

The Bradney Improved Jack Screw

A new jack screw in which the supporting ram does not revolve, is being introduced by the Bradney Machine Co., Inc., Middletown, N. Y.

The advantages of this new type over the old are said to be as follows: In the new jack screw the ram does not revolve, thereby eliminating the necessity of a swiveled cap, a source of constant trouble and wear. This ram moves up and down in a square space extending to one in. below top, leaving nothing to wear but steel case-hardened nut.



The New Bradney Jack Screw

The ram of this new jack screw does not revolve. but moves up and down, leaving nothing to wear but the steel case-hardened nut.

The load moves constantly upward and away from the operating lever, thus preventing possible injury to the hands, sometimes caused by the load following the operating lever and collapsing.

Another particular feature of this device is that the ram cannot possibly be raised out of the body while lifting a load, but when necessary the ram can be removed by removing a locking pin placed there for that purpose. Misplacement of the operating lever when not in use is not very apt to occur, as sockets are provided for it on the body of the jack screw.

The standard sizes of the Bradney jack screws range from 5 to 30 tons. Special sizes may be obtained up to 50 tons. The list prices for standard plain jacks range from $4.50 to $37.50.

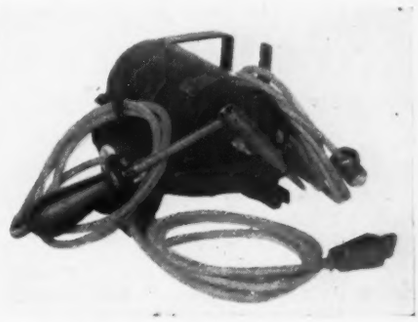
The United & Globe Asbestos Products

Many asbestos products are produced in the asbestos department of the United & Globe Rubber Co., of Trenton, N. J. The Globestos multiple disc clutch rings, brake blocks, Ford transmission lining and radiator hose are products of this department. The clutch rings are manufactured of the best long staple Canadian asbestos cloth, reinforced with brass wire of high tensile strength. This concern is also manufacturing a high-grade quality Red Inner Tube at a medium price. It is known as the Safety Brand Tube. The tube is sold in quantities only to the jobbing trade distributors.

A New Lead-Burning Transformer

The General Electric Co., of Schenectady, N. Y., has developed a lead burning transformer to be used particularly for burning terminals in place, removing old cell connections or straps and cutting off or building up posts on storage batteries. This transformer is designed to be connected to the ordinary 110-volt alternating current lamp socket, a 10-ft. cord with plug being provided for this purpose. This attaching cord is protected by a special rubber covering against hard wear, dirt and acid with which it may come in contact. Connection to the transformer is made through a plug and socket. This plug can be used instead of the snap switch in the lamp socket for turning the current on and off. On the opposite side of the transformer, two individual rubber-covered terminal leads are used to convey the low voltage heat-producing current to the parts of the battery to be welded.

In practice, the lead having the clip is fastened to the battery cell connector or any part of the battery that is to be worked. The other lead has, at its end, a carbon holder which is arranged with a heavily insulated handle so that the operator's hand is guarded from the heat. Any size carbon can be inserted in the carbon holder. The carbon forms the second terminal. When the pointed arc welding carbon is brought into contact with the lead to be melted, the circuit is closed. The great resistance of carbon causes the pointed end to become intensely hot, but this heat is said to be concentrated so that it melts the lead over the specific area desired.



Lead-Burning Transformer Made by the General Electric Company

It can be connected to any ordinary 110-volt alternating-current lamp-socket

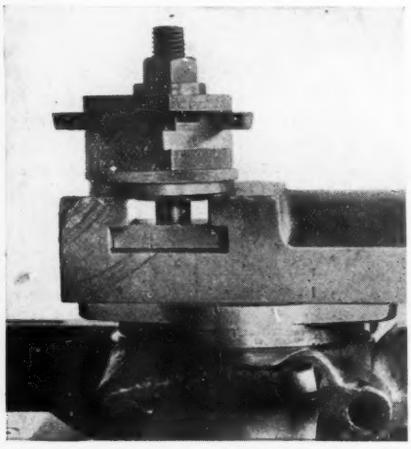
This device weighs approximately 25 lb. A convenient handle makes otherwise difficult corners accessible. The slag that automatically rises to the surface of the molten lead, obviates the necessity of cleansing the parts to be joined.

Federal Rubber Co. of Illinois, announces the establishment of a distributing center at Richmond, Va. G. P. Blodgett has been appointed manager and will supervise the sales throughout the district.

Myers Lathe Tool-Holders

The Universal tool holder is a device designed to simplify the method of holding the cutting steel. It is claimed to fit any lathe and guaranteed not to chatter or gouge the work.

In construction, it is a miniature turret, holding four different sizes of cutting steel, from ¼ in. square up to and including ½ in. square; two sizes of boring bars, ½ in. and ¾ in. round, and a standard ¾-in. cutting-off and threading tool. These various placements can be arranged without removing the nut from



The Myers Universal Tool-Holder
This is the No. 1, a simple labor-saving device which will fit any lathe

the stud-bolt. If a change in the cutting-edge center is required, a turn of a taper-plate at the bottom of the holder will raise or lower the center ¼ in. The holder is cinched down on the compound rest, thus giving it a rigid holding surface of over 2 in.

The Universal heavy-duty tool holder is similar to the lighter model described above except that it is of stronger construction and will hold tools of sizes ranging from ¾ in. square up to and including 1 x 1¾-in. steel. The cutting-edge center can be raised or lowered ½ in., and is constructed to give a 5-in. holding surface to the cutting steel. The spiral-spring at each end of the holder automatically raises the top plate when the nut is released on the stud bolt, thereby permitting immediate placement of any sized tool. Two cutters can be used at the same time for work requiring more than one operation.

These products are manufactured by the Myers Lathe Tool Co., Los Angeles, Cal.

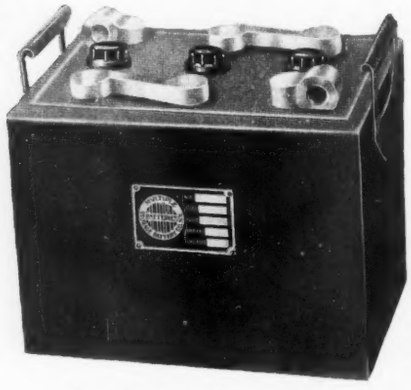
The New G & O Heavy-Duty Type Cooling Unit

The G & O Mfg. Co., of New Haven, Conn., has recently developed a heavy duty type of cooling unit. It consists of a tubular core made of seamless cold drawn copper tubing. This tubing is ⅜-in. outside diam., with walls .025 in. thick and has square radiating fins. This concern believes that the bulk of cooling in a fin and tube radiator depends on the radiation from the fins about the tubing. A very liberal area of contact has been provided between the fins and the tube. This is to permit the heat to pass readily off to the fins and from there to be expelled.

This construction is brought about by the use of individual fins with the center section stamped down at right angles, making four liberal triangular shaped collars which lie in contact with the tube when the fin is driven over the latter during the process of manufacture. The fins are then thoroughly soldered. The tubes are securely built into rolled copper header plates, which in turn are bolted to the cast upper and lower radiator tanks.

A New Storage Battery

A new storage battery, known as the Multiple, has been placed on the market by the Multiple Storage Battery Co., of 104 W. 52nd street, New York City. This battery has a multiple grid, which, it is claimed, contains a higher percentage of metal than the usual corresponding size. This means greater strength



The Multiple Storage Battery

and higher conductivity, while there is still less metallic or inactive lead exposed to the action of the electrolyte. This strength means greater conductivity and insurance against buckling and warping strains, which result from rapid charging or discharging of the cell. The maker states the greater conductivity of the multiple grid makes possible the delivery of a great amount of current at the terminals with little internal loss. The multiple cells are assembled in a containing jar made of any one of three materials according to the service required and the preference of the users. These are hard rubber, glass or celluloid. Each cell is securely sealed within its own containing jar and is a separate unit. Great precautions are also taken to seal the cells in the containing cases to prevent any leaking or spilling of the electrolyte. The terminals of multiple storage batteries are made of a non-sulphating material which resists action of the acid used in and around the charging stations.

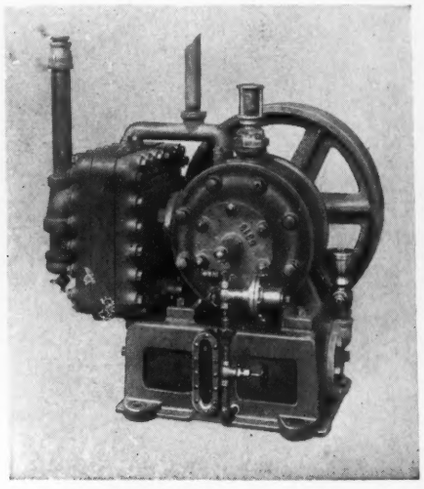
Globestos Brake Lining

The United & Globe Rubber Co., of Trenton, N. J., is manufacturing a hydraulic-compressed, folded and stitched brake lining, known as Globestos. This brake lining is compressed under tremendous hydraulic pressure to make it as dense as possible. Pliability is also maintained, because it is of considerable importance to uniform braking efficiency. The maker states it will not grip or grab in use, or squeak, because its pliability enables it to adhere to every given point of the brake drum.

Jackson Rotary Air Compressor

The Jackson Compressor Co., Inc., Denver, Colo., is manufacturing an up-to-date air compressor. This rotary-type compressor is light in weight and saves floor space. It is claimed also to effect a saving in power, due to fewer moving parts and less vibration. Other advantages claimed are little slippage, noiseless movement and small operating cost.

This compressor is designed to operate with but one valve. The function of this valve is to reduce the power required to operate the device. The oiling system consists of an automatic valve, controlling feed to both compressor and bearings. Hyatt heavy-duty roller bearings are used. The compressor is also equipped with a single pulley having a face of 3¼ in. to take a belt 3 in. wide. Speed varying from 300 r.p.m. to 600 r.p.m. can be obtained, delivering a proportionate volume of air. The normal rating of the 4-A-5 compressor is 11 cu. ft. of free air compressed to 100 lb. gage a minute. The capacity can be varied to meet various requirements in pressure, volume and horse-power. The net weight of the compressor is 225 lb. This product sells for $150 f.o.b. Denver.



The Jackson Rotary Compressor

L. B. Gotschall, 241 N. St. Paul St., Dallas, Texas, will handle the Roller-Smith Company's lines in the State of Texas, with the exception of a small territory in the western part of the state.

American Tire Repair Articles

Many useful tire accessories and repair articles are manufactured by the American Tire & Rubber Co., of Akron, Ohio. Among these is the Clingtite Cementless Tube Patch. This is made with a molded pure gum base, on which a layer of the American 5 Minute-Cure Vulcanizing Cement, in sheet form, is applied under pressure, making a patch of cured and uncured stock. The uncured portion is protected with Holland cloth.

The Double-Wing Blowout Patch is made of heavy tire fabric, the same as



Double-Wing Blowout Patch

The wings slip under the bead on each side and prevent the patch from sliding around in the casing

new tires. The layers are thoroughly frictioned and stick firmly together. The patch is pliable and will remain that way. It is made in DeLuxe type, extra long, and the standard type. The regular sizes are 3, 3½, 4, 4½, 5 and 6 in. The tire plaster comes in two sizes, 5 x 7 in. and 7 x 9 in. and is used on the inside of the casing to prevent damage to the inner tube in case of a puncture or a blowout.

The American-Akron Reliner is made of genuine tire fabric, frictioned and made on individual cores to conform to the shape of the casing. It is treated with cement, which vulcanizes the patch fast when it is used.

The Lace-On Boot forms a temporary emergency patch for the outside of the casing. It consists of several layers of heavy tire fabric with vulcanized rubber surface. It is molded and shaped to



The Cementless Tube Patches

These patches vulcanize themselves permanently to the tube, through the heat created in service. There are ten patches in a box.

the size of the tire. This patch is cut for raw-hide lacings with the layers stepped down at all edges to prevent friction.

The American Co. is also manufacturing the Hook-On style of boot; Flaps to avoid pinching of the tube; Roadside Repair Material; Rubber Patching Material; Filler Strips; the 5-Minute-Cure Vulcanizing Cement; Valve Bases, etc. Among the shop equipment this concern produces are Air Bags. They have layers of fabric and high-grade rubber built up



The Lace-on Boot

These form an excellent temporary emergency patch and prevent the tube from being damaged

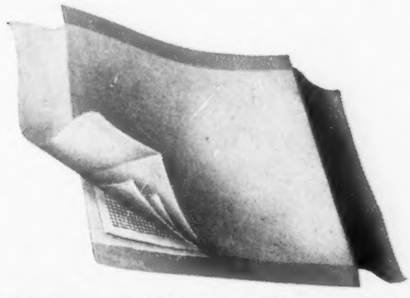
to withstand the tremendous heat, and the ends are reinforced to a degree which makes it practically impossible to cause a blowout or other defects which might render the bag useless.

This concern also manufactures Ribbed Retread Bands; Vulcanizing Material; Liquid Cement; Repair Fabric; Tire Talcum; Tread Gum; Tube Gum; Cushion Gum, etc.

New Inside Blowout Patch Has Steel Wire Mesh

The Durham Mfg. Co., 230 Rialto Bldg., Kansas City, Mo., has placed on the market the Dur-A-Bul Wire Knit Blowout Patch for the inside of casings. The Dur-A-Bul patch is composed of from five to nine plies of cushion and wire.

The maker states that it will withstand the pressure under load without



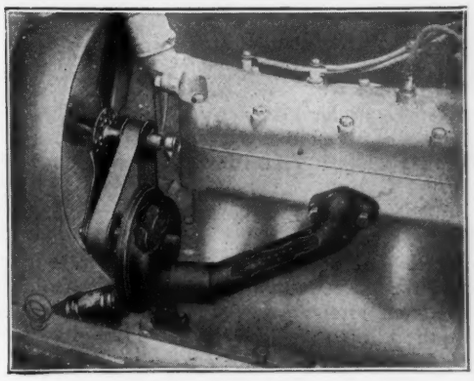
The Dur-A-Bul Wire Knit Blowout Patch

Some of the plies of fabric are peeled back to show the steel wire

stretching. It will hold the pressure very evenly so that breaks in casings do not get larger. The wire mesh, which is of steel, is laid in 1-32 cushion stock and the entire patch is thoroughly cemented together, which allows flexing without separation. This cushion acts as a bumper for road shocks the same as the cushion in the tire. Most of the fabric is laid next to the tube and the maker states that the wire will not break through it. The wire extends to within ¾ in. of the edges of the patch, making them uniformly strong. The patches retail at from $.75 for the 3-in. size to $1.50 for the 5-in. size. Each patch is sold in an envelope, 10 patches to a carton and 10 cartons to a case.

Centrifugal Water Circulator for the Ford Power Plant

A new water circulator of the centrifugal type for the Ford power plant known as Model 10, has been announced by the Universal Motor Supply Co., of 20 E. Jackson Blvd., Chicago, Ill. This water circulator, which sells for $9 complete, with belt and bolts for installation will keep the engine cooler. By avoid-



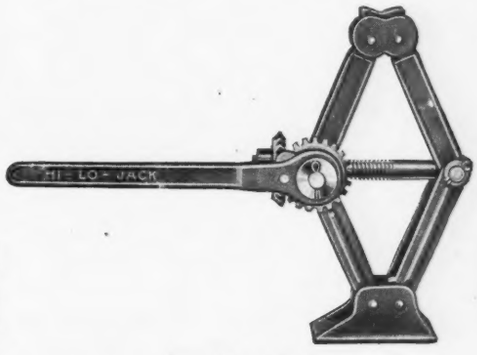
Universal Centrifugal Water Circulator

Water circulator for Ford cars, tractors or trucks

ing any possible overheating, carbon deposits are reduced, and also wear and tear on the power plant. No new pump hose connections are necessary.

Rowe Calk Now Manufactures Hi-Lo Jacks

The Rowe Calk & Chain Co., of Plantsville, Conn., has taken over the sole manufacturing and selling rights of Hi-Lo Jacks, formerly made by the Hi-Lo Jack Co., of Worcester, Mass. The jack, illustrated herewith, is constructed on the toggle-joint principle and its lifting power increases as the load is raised.



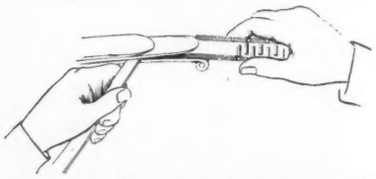
The Hi-Lo Jack

It occupies but little space; will start to lift its load at 6 in. and will raise it to a height of 17 in. It has a long handle which gives sufficient leverage to raise a heavy load with little effort. This jack is made in six sizes. The prices range from $7 to $17.50.

Hamilton Roller Bearing Inserts for Springs

The Hamilton Mfg. Co., of Los Angeles, Cal., is making a device designed to facilitate free and easy movement between the leaves of an automobile spring. It is known as the Hamilton Roller Bearing Inserts for Automobile Springs.

The roller bearings, made of hard Bessemer steel, are arranged in a sheet steel case. The length of the case varies, but the width is similar to the width



These Roller Bearings Are Inserted Between Spring Leaves and Are Designed to Facilitate Free Movement of Springs

of the spring in which it is to be inserted. The horizontal edges are flanged. The roller bearings are attached at one end of the case extending, alternately, from one edge, then the other, until the required number have been assembled. The other end of the case is left entirely free, so that the inserts can be wedged more securely between the leaves of the spring.

The operations entailed in attaching the Hamilton roller bearing inserts do not involve any mechanical difficulty. The steps necessary are as follows:—

Remove the bolt from the spring clip at the outer end of the spring. Before proceeding further, prepare inserts by covering the rollers on both sides with graphite grease. Then insert a heavy screw driver or other blunt instrument between the longest leaf and the adjoining leaf of the spring so as to force an opening at the outer end of sufficient dimension to receive the long insert. In exactly the same manner separate the two succeeding leaves and place the short inserts in like position between these leaves. The operation is now completed by replacing the original clip. Both ends of each of the four springs are treated in the same manner.

The construction of the roller bearings is such that the graphite applied to the springs is apt to remain for a longer period than the graphite applied to the standard spring.

The retail price is $4.75 for a complete set for Ford or Saxon car, and $9.75 for any other make of car.

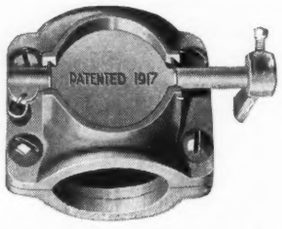
Diamond Radius Rods and Connecting Rods for Ford Cars

The Diamond Forging & Mfg. Co., of Pittsburgh, Pa., is producing connecting-rods and radius rods for Ford cars, and is adding other Ford replacement parts to its line. The radius rods are forgings of high quality steel and are accurately finished. The tubing is not tapered or welded, the forgings at each end being pressed into the tubing for a considerable distance under a pressure of 100 tons and afterwards riveted. The price of the Diamond radius rod is $1.25.

The Ford connecting rods sell for $1. They are drop forgings and possess exceptional strength yet are very light weight. The Diamond babbitt bearing is of excellent quality and is made a complete unit by a special process to avoid the necessity of securing it to the forgings by fins or drilled holes.

New Am-Pe-Co., a Muffler Cutout for Ford Cars

The American Machine Products Co., Marshalltown, Iowa, manufacturer of automobile parts, has recently brought out and is now marketing a new engine testing muffler cutout for Ford cars known as the "New Am-Pe-Co." As shown in the accompanying illustrations,



New Am-Pe-Co. Engine-Testing Muffler Cutout for Fords

the muffler embodies but three principal castings securely assembled. The valve is cast in one piece with the journals. It is thick and the edges are beveled so as to insure a joint that is tight when closed. The strong high tension springs that are used obviate the need of the large and clumsy spring. The muffler is controlled by a pedal consisting of two parts, working on a fulcrum.

Sizes range from 1½ x 2 in. to 2¼ x 2¼ in. and the prices from 96 cents to $1.50.



The Pedrick Piston Ring

A new piston ring, known as the Pedrick, is being manufactured by the Motor Parts Company, Philadelphia, Pa. The method of construction is declared to give it a pressure of equal radial tension at all points. Correct concentric shape is said to afford easy handling when placing in grooves. Machined joints and ground sides are claimed to entirely obviate leakage. Material and methods used in casting tend to increase the springiness of the ring.

The Kralieck Oiling System for Ford Cars

Charles Kralieck & Co., Cleveland, O., are distributing through the M. & M. Co., of the same city, a safety oiling system manufactured exclusively for Ford cars.

This system is said to create a more effective circulation. The oil passes into a plate that replaces the transmission cover, cleaning it of pieces of lining and any other foreign matter extracted by a set of long steel teeth located at the plate entrance. This foreign matter is



The Safety Oiling System Plate

This replaces the regular transmission cover, strains the oil and directs it to the pipe leading to the front of the engine.

then deposited in the bottom of the plate. Clean oil, consequently, passes from the plate into a pipe outside the engine and is carried to the front of the engine, cooling it at the same time. From this point the oil works back to its starting place, renewing the cycle.

The lower lip on the plate is designed to send a stream of oil over the transmission gears and foot brake, thereby eliminating possible chattering. Its simple construction facilitates attaching.



The Safety Oiling System

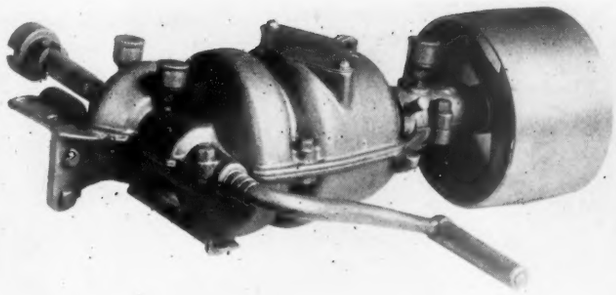
Showing the plate attached and the course of the oil through the pipe to the front of the engine

There are no working parts to this system and the manufacturer guarantees that it will outlast the car on which it is attached. This system can be procured from the distributor for $5.

Centrifugal Governor and Twin-Blade Fan Features Andrew Power Transmitter

The Andrew Power Transmitter is a device which is powered directly from the engine crankshaft. The design of this power transmitter is such that the pull is in a line with the body of the car and hence there is no unusual side pull while it is being used. The shifting lever is designed to throw the pulley out of gear when driving the car. This device is neat in appearance and nicely enameled, so that it can be left on the car if desired.

The feature of this outfit is the enclosed fly-ball governor, which controls the speed of the engine and eliminates the need of an extra hand at the throttle. When a heavy load is put upon it, throt-



The Enclosed Fly-Ball Governor Controls the Speed of the Engine and Eliminates the Need of an Extra Hand at the Throttle.

tle is opened, and as the load is released the engine is throttled automatically. Included with this outfit is a twin-blade fan, an important accessory when the engine is operating with a heavy load and the car is standing still. The standard pulley supplied is 8 x 4½ in.; special, 7, 9 and 10 in. The cut gears are made of high carbon machine steel. The governor is fully enclosed; phosphor bronze bearings, renewable when necessary, are provided. The retail price of this power transmitter is $40. It is made by the Andrew Motor Mfg. Co., 836 Muskego Ave., Milwaukee, Wis.

The Motalarm

A new device which is designed to give warning when the engine becomes overheated in any manner, is being marketed by the Motalarm Corp., 1777 Broadway, New York City. This device attaches to the radiator cap. It has a pipe protruding through the cap, which carries steam from the radiator up to the siren, which is enclosed in the upper part of the alarm. This pipe is removed by simply unscrewing the knob at the top



The Motalarm

Gives warning when there is danger of the engine becoming overheated when the water is low, or cooling becomes defective in some other manner.

and lifting it out. It is coated with a paint to which water will adhere and which indicates how much water there is in the tank. The siren will sound only when the water has dropped below the bottom of the tube, the tip of which is 1 in. from the bottom of the radiator tank. The price of the Motalarm is $3.

Bossert Corp., Utica, N. Y., manufacturer of sheet metal stampings, announces that it has recently opened an office in Cleveland, Ohio, at No. 611 Citizens Bldg. W. W. Vesy in charge.

The Ross Timer Grinder

This is a bench grinder for grinding the contacts of Ford timers to an absolutely round true surface. The machine is fitted with a special chuck that requires no skill whatever in centering; the grinding stone revolves inside the timer at a high speed, while the chuck and timer very slowly revolve around the stone. It



The Ross Timer Grinder

is fitted with a very accurate adjustment, so that the oldest and most worn timer may be ground with a surface equal to new in from two to three minutes.

The whole machine is substantially constructed, all gears being cut from solid steel bar. Lubricators are fitted to all moving parts.

When not in use as a timer grinder, the chuck may be instantly removed, a large wheel fitted, and the machine used for grinding tools, twist drills, etc. The price is $21, f.o.b. Boston. Made by the McCulloch Machine Co., 216 High St., Boston, Mass.

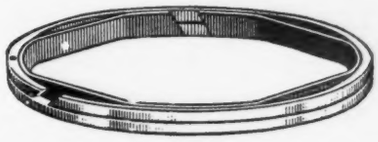


Cooper Adjustable Hose Clamp

Simplicity and ease of application are features of the Cooper Adjustable Hose Clamps. The clamp consists of a pliable strip of metal, two connecting heads, and one screw bolt. The length of strip varies from ten inches to twenty inches, relative to hose sizes, ranging from five-eighths inch to three inches diameter. The Otis-Flagg Corporation, York, Pa., is the manufacturer. The price of a hundred, unassembled in a box, is $8, and the same number assembled in individual boxes cost $11

The New Bulldog Steel Spring Piston Ring

The Bull Dog Steel Piston Ring for Ford cars has been introduced by the Steel Spring Piston Ring Co., 2 Columbus Circle, New York City. The feature of this new ring is that the tension does not depend upon the metal, but upon a



The Bulldog Piston Ring

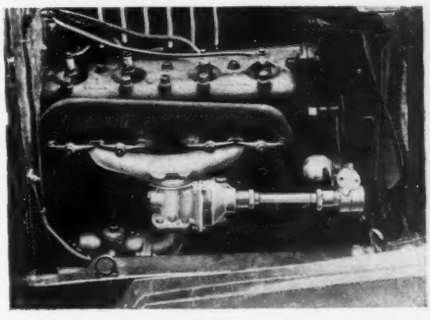
This is a new three-piece ring which is just being introduced. The spring element in this ring is separate from the wear member.

separate element, the spring insert. This feature is stated to give a constant uniform pressure at all points.

The wear member is made of steel and is stated to have unusual life. The spring, which cares for proper expansion, bears evenly all around, as there are eight points at which it touches the wear member of the piston ring, these points being at equal distances.

New Simplex Universal Governor for Ford Cars

A new governor for the Ford car, Ford truck, truck units and tractor units has been announced by the Duplex En-



Simplex Universal Governor Attached

This new product of the Duplex Engine Governor Company can be attached to any Ford power plant

gine Governor Co., Inc., 36 Flatbush Avenue Extension, Brooklyn, N. Y. This is a centrifugal type of governor which has a grid valve for controlling the amount of gas passing to the engine. The drive is from the front of the Ford engine through shafts and cut gears to the member inserted in the manifold. With the outfit is included a Simplex Universal Manifold and an elbow for attaching the carburetor to the governor. No machining of parts is necessary to install this, nor is it necessary to drill any holes. The complete outfit weighs 14 lb.

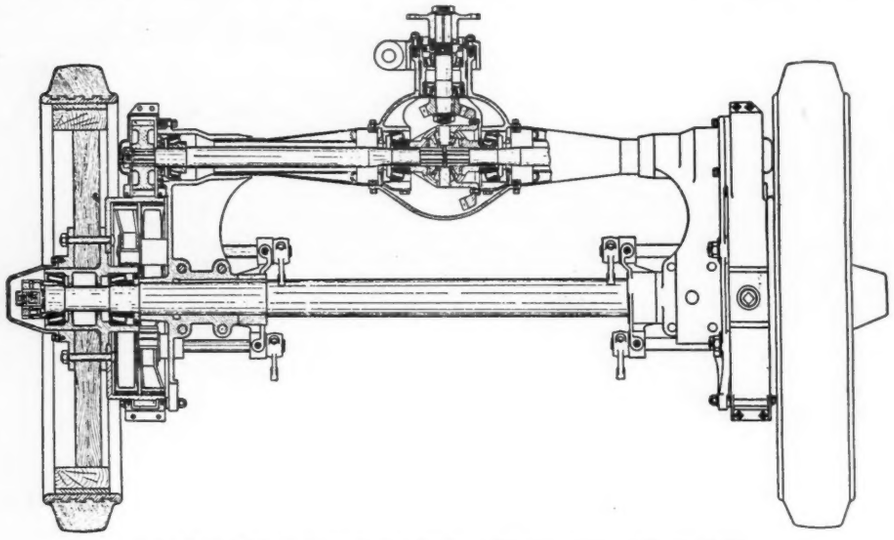
The Badger External-Gear Rear Axle

The Automotive Engineering Co., 445 Milwaukee St., Milwaukee, is manufacturing the Badger External Gear Rear Axle for motor trucks in from 1½- to 5-ton capacity. In this axle all working parts are absolutely enclosed and free from grit and dirt. The driving gears are of nickel steel, heat-treated, and the load carrying member is separate from the driving member. The load carrying member is a solid single-piece, treated and annealed chrome nickel steel forging and the spindle ends are forged integral. The spur gear drive is utilized in this axle. The drive gears are parallel and rolling in contact. To lubricate the spur gears it is unnecessary to remove the wheels, as an opening is provided in the gear cover for adding lubricant.

Another point to be considered is that the road clearance is greater than usual, as the differential housing is placed forward and slightly elevated, so that the entire road clearance is between the road and the bottom of the dead axle.

All the vital parts of this axle are of ample dimension. The parts are interchangeable and any replacements necessary, can easily be made. Taper roller bearings which are adjustable are provided.

In addition to making axles for 1½- to 5-ton trucks, the maker is also planning the production of ¾- to 1-ton models and 7- to 7½-ton models.



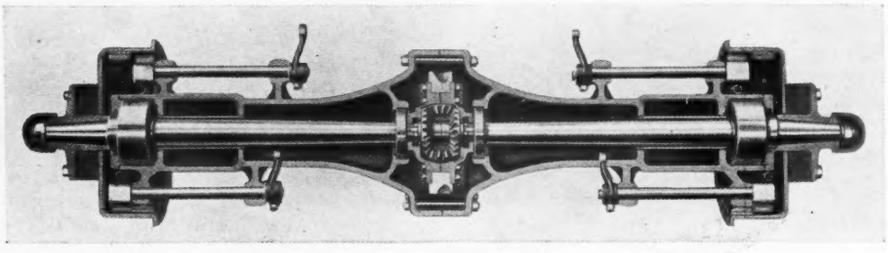
Sectional Drawing of the Badger External-Gear Rear Axle

This rear axle is spur-gear drive with the gears fully enclosed and operating in oil. It is made for motor trucks in from one and a half to five-ton capacity

The New Empire Worm-Drive Axles

The Empire Axle Co., of Dunkirk, N. Y., has recently announced two new worm drive axles, Models L and N. These show many improvements in design, finish and equipment and are of excellent material.

Hotchkiss drive is used; that is, drive and torque are taken through the springs. Worms and gears are of the straight type—the worms being 3½ per cent. nickel steel, case hardened and accurately ground to correct tooth forms. The worm gears are cast from special phosphor bronze of exceptional hardness and high tensile strength and are cut by the hobbing process. The drive shafts are high grade chrome nickel steel, heat-treated, after being machined and ground to size—¾ floating type. The housing of these axles is semi-steel and constructed in two pieces. Access is gained to the worm mounting, worm gear and differential by removing spring clip bolts on one side and the center housing bolts.



Cross-Section of the New Empire Axle

Two new Empire axles, Models L and N, have just been announced. They show improvement in design over previous models and both are worm drive

Heavy duty ball bearings are used throughout and the differential is a Brown-Lipe-Chapin. Brakes are of the dual external expanding type, while brake drums are held centrally so that they cannot drag and when the shoes are expanded they draw with equal pressure upon the entire circumference of the drums. The latter are of pressed steel. The entire mechanism is enclosed and operates in oil.

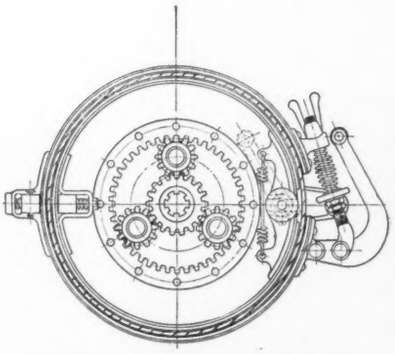
The Model L, which is for trucks with 1-ton pay load, has a carrying capacity of 4000 lb. on spring seats. Approximate weight is 450 lb; the minimum spring center is 38 in.; maximum 41½ in. for 2½-in. spring; the track is 58 in.

Model N, for truck with 1½-ton pay load, has a carrying capacity of 5000 lb. on the spring seats and weighs approximately 500 lb. The spring centers and track are identical with Model L.

Walker-Weiss One-Ton Axle

The Flint Motor Co., Flint, Mich., successor to Walker-Weiss Axle Co., has developed an axle of the full-floating type designed for a one-ton truck.

It is claimed that all gears, bearings (except the wheel bearings), and main shafts, can be adjusted or replaced without removing the axle from the car, or the wheels from the axle. The construction is such that the main shaft is subjected to driving strains only. Elimination of noise and insurance of longer life are claimed through the accurate tooth bearing of the bevel gear set. All gears are completely inclosed and lubricated, with the bearings, by an oiling system that sends oil from wheel to wheel.



Walker-Weiss Internal Gear

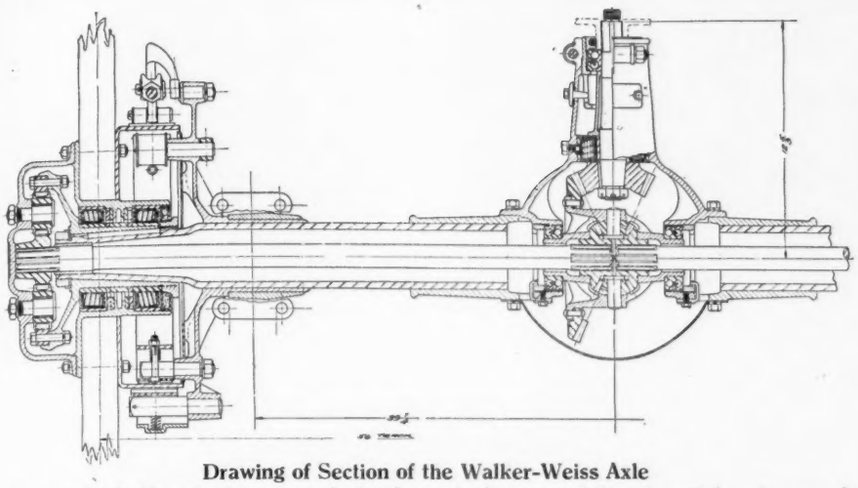
This illustration shows the layout of the gears at the hubs, which provides a second reduction in gearing

The three pinions of the internal gear train allow three bearings of tooth on the internal gear ring, thereby equalizing strains and also permitting the use of smaller gears.

The brakes, 14 x 2½ in. wide, are of the toggle-external-contracting type and the cam-internal-expanding type.

Hyatt high duty roller bearings are used in the wheels and also directly behind the pinion on the pinion shaft. At the outer end of the pinion shaft and on the differential, there is a New Departure ball bearing.

Extra strong shafts are employed in this assembly. They are chrome nickel



Drawing of Section of the Walker-Weiss Axle

Showing the double reduction, one at the bevel gears in the center of the axle, and the other at each hub, a set of internal gears furnishing the latter reduction

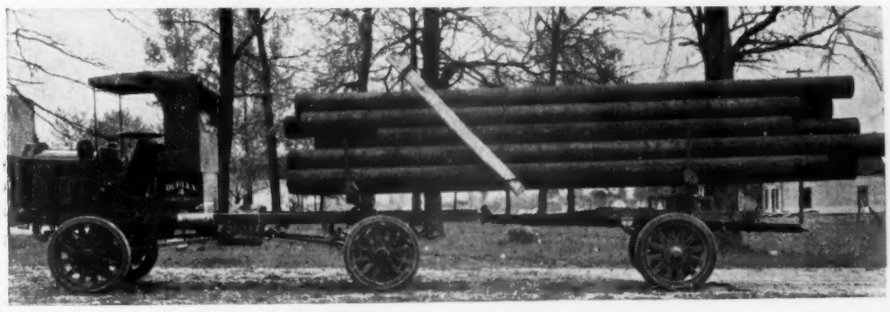
steel splined on both ends and heat treated.

Further specifications are: Tread, 56 in.; carrying capacity on spring seats, 3800 lb.; spring seat centers, 40 in. maximum, 38 in. minimum and 39 in. standard for 2½-in. wide and ⅝-in. clips; gear ratio, 7⅛:1 to 8.8 to 1 total reduction; bevel gear ratio, 3.33 to 1; 6-8 pitch internal gears, 1¼-in. face.

The Miami Pipe Trailer

A new Miami trailer built especially for oil field work and known as the Miami Pipe Trailer is being manufactured in three models by the Miami Trailer Co., of Troy, Ohio. The swinging bolsters and the bolster slides on these trailers are exceptionally strong, as these slides bear an exceptional amount of the load when the trailer passes into a deep rut. The dogs are adjustable to any width and the locking of these does not depend upon pressure for security. The standards are 2-in. cold rolled steel. The trailer bolster is built up of 5-in., 6½-lb. channel steel and has cast steel spreader blocks at each end and center. The king bolt is 1⅜-in. cold rolled steel. The truck bolster is the same in size and strength as the trailer bolster.

The hitch to the truck consists of two oversize steel castings on the universal joint principle, so flexible that the trailer can tilt to a 45 degree angle without binding. The coupling pin is 1½-in.



One of the Miami Trailers Built for Oil Field Work

These trailers are built exceptionally sturdy and are especially strong at each point where breakage is likely to occur

Specifications

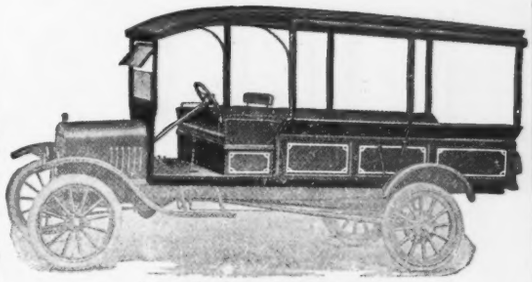
Model 123 has a rated capacity of 2 tons; the axle is a Timken 2¼ in. square; the bearings Timken; wheels artillery type, 12 spokes, 2½ in., second growth hickory; tires, 36 x 5 in., pressed on; the springs are semi-elliptic, 42 x 3 in., with 11 leaves; the frame length is 9 ft.; tread is 56 in. and the shipping weight 2000 lb.

Model 124 has a rated capacity of 3 tons. The axle on this model is a Timken, 2¾ in. square; bearings are Timken; wheels, artillery, twelve 3-in. spokes of second growth hickory; tires are 36 x 6 in., pressed-on type; springs are 42 x 3 in., oil tempered, semi-elliptic, with 13 leaves; the frame is 5-in. channel, 9 ft. long and 44 in. wide, the same as Model 123. The tread is 56 in. and the shipping weight 2600 lb.

Model 126 has a rated capacity of 6 tons; the axle is a Timken 4 x 4 in. square with Timken roller bearings; the wheels are artillery type with 12 spokes, each 3½ in. The tires are 36 x 5-in. dual, pressed-on type. This model uses springs 44 x 3½ in. and 16 leaves; the frame is of 7-in. channel steel, length 9 ft., width 42 in.; the tread is 63 in. and the shipping weight 3200 lb.

Continental Commercial Bodies

Continental bodies are manufactured and designed expressly for Ford chassis and are adaptable to every line of business in which the Ford is used. The lumber used in the construction of these bodies is kiln-dried and well ironed to prevent body racking. The 1-ton body, No. 550, has canopy top. Loading space behind driver's seat is as follows: Width, 45 in.; length, 94 in.; depth of sides, 12 in.; flare-boards, 7 in. wide. The floor is ironed. The roof is slatted and covered with heavy oiled duck. Drop tail gate and chain. Painting, dark green. No. 551 is a 1-ton open express body



No. 550 Express Body

with chassis as shown in the illustration. Same dimensions as No. 550, except side panels, which are 14 in. Cushions and lazy back in both models are well upholstered in imitation leather.

The Continental Car Co. of America, Louisville, Ky., is the manufacturer, and its products are sold exclusively to authorized Ford agents.

Ritcheson's "3-in-1" Truck Body

A. A. Ritcheson, 506 First State Bank Bldg., Dallas, Tex., has been granted patents on a "3 in 1" truck body especially designed for the Ford 1-ton truck, although it can be applied to any make of truck. The body permits a loading space of 5 x 8 ft., with a depth of 4 ft. The body can be made up into a grain, cattle or platform body. Mr. Ritcheson is licensing truck body makers to build this body.

John N. Willys to Market New Electric Light and Power Plant

A modern electric lighting and power plant for farms, rural schools and churches, suburban homes, yachts, etc., is to be manufactured by one of the John N. Willys companies, the Electric Auto-Lite Corp., of Toledo, Ohio.

The new system will be known as Willys Light. It will be marketed by the Willys Light Division of the Electric Auto-Light Corp. through distributors and dealers. The formation of the sales organization is now under way.

Build Now!

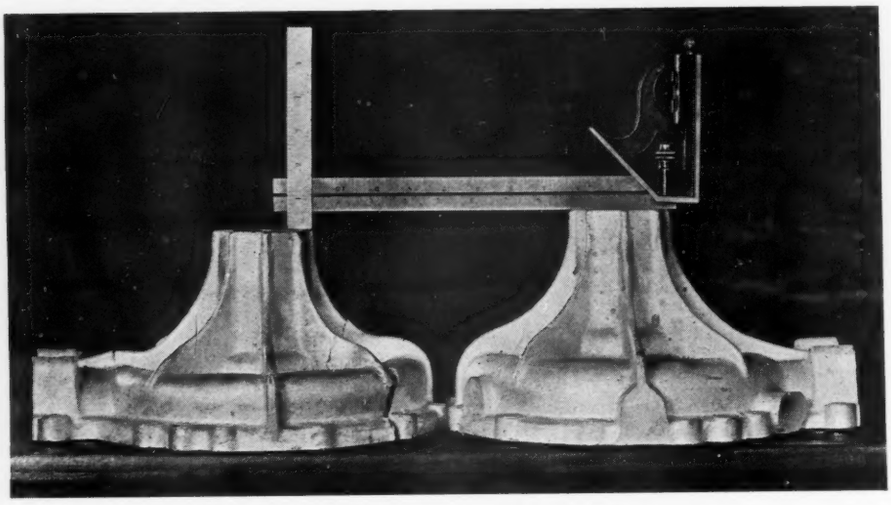
Money spent for good roads will come back, because the road will bring it back

New Aluminum Alloy Permits Greater Reduction of Weight in Motor Truck Parts

THE Aluminum Castings Co., of Cleveland, after many months of research and experimental work, has succeeded in producing commercially a new Lynite alloy which greatly extends the possibility of weight reduction for the motor truck manufacturer.

This new alloy is of particular value, in that it makes possible a saving of weight where it is of prime importance, namely, a cutting down of the unsprung weight, because this new alloy is primarily intended for use in such parts as differential carriers, rear axle housings and other parts below the springs. results of recent tests on a rear axle housing at the Winton Engine Works in Cleveland. The housing used in this test weighed about 90 lb. as compared with 175 lb. for a similar housing made of cast steel. While the cast steel housing weighing 175 lb. showed a permanent deformation of about ½ in. at six tons pressure, the Lynite housing when subjected to this pressure showed no deformation whatever.

After the pressure of six tons had been applied, the pressure was increased to seven tons, then to eight tons and finally to nine and a half tons, at which the casting broke.



Showing the Reduction in Height of the Castings

Casting on the left made of Lynite 145 showed a reduction of one-half inch before it broke under forty thousand pounds pressure

From a purely manufacturing point of view, a great saving is effected by the handling and machining of the lighter

This new alloy is not intended to supplant any of the Lynite alloys now in general use for such parts as crankcases, cylinder castings, oil pans, pistons and others, but it is aimed especially to meet the requirements of those parts which require a high combination of strength and ductility.

A good idea of what can be accomplished with this alloy is given by the

At seven tons it showed a permanent deformation of only 3-64 in., while under the successive six, seven and eight ton pressure it showed only 1-16 in. deformation.

Another test was recently made with a differential housing for the purpose of comparing the Lynite No. 112, the standard Lynite alloy, and the new alloy, Lynite No. 145.

The average physical properties obtained from standard test bars of these two Lynite alloys are shown in the following table:

	Lynite 145	Lynite 112
Specific gravity	2.90 to 2.96	18,000 to 22,000 lb. per sq. in.
Tensile strength	27,000 lb. per sq. in.	2.81 to 2.86
Elongation	4.5 per cent. in 2 in.	1.0 to 2.0 per cent.
Brinnell hardness as ordinarily cast, using 500 kg. pressure	60 to 70	55 to 70
Merit number	120,000	30,000
Machinability	Good	Good
Pattern shrinkage	0.156 in. per ft.	0.156 in. per ft.
Modulus of elasticity	10 million	10 million
Lb. per cu. in.	0.106	0.103
Lb. per cu. ft.	183	177

The casting made of Lynite 112 broke under a pressure of 36,000 lb. exerted upon the small end. There was no appreciable reduction in height. The other casting, made of this new alloy, did not break until 40,000 lb. pressure had been applied and then only after a reduction in height of ½ in.

The merit number for Lynite 145 is 120,000, as against 30,000 for Lynite 112. The merit number is the product of the tensile strength and elongation. Usually when the tensile strength of a metal is increased, its elongation is decreased. When both increase the product or merit number increases very rapidly. The merit number itself means little unless the various factors entering into the computation of this value are known, inasmuch as lead or pure aluminum would have high merit numbers. In these cases the elongation is high and the tensile strength low. High elongation indicates that the range between elastic limit and ultimate strength is great and hence the elastic limit itself very low both in lead and in pure aluminum. These are not valuable as structural materials, therefore, because of their low elastic limits in spite of the high merit numbers. It is necessary, therefore, in connection with the interpretation of merit numbers to know both tensile strength and the elongation from which the merit numbers are calculated. Strictly speaking, the actual merit numbers in metals in which the reduction of area is determined, involve tensile strength, elastic limit and reduction of area and some constant factor.

In bringing out this new alloy the Lynite Laboratories have proceeded in accordance with one of the outstanding purposes of the company, which is to produce alloys for specific applications and in time to extend the Lynite group until it includes an alloy for many other motor car and motor truck parts, now made of heavier metals.

Twelve Talks to Engineers is the title of an interesting booklet just published by the Clark Equipment Co., Buchanan, Mich., manufacturers of Clark internal gear drive axles. The booklet consists of practical engineering talks and illustrations describing the principles which enter into the construction of the motor truck axle. On the facing page of each "talk" is a photograph of that section of the axle mechanism discussed on the opposite page, while at the bottom of the talk is a pencil sketch showing the same principle in operation in some other field of life or industry. Booklet will be mailed to those interested.

Draft of China's Revised Tariff.—The Asia Banking Corp., at 35 Broadway, New York, has just issued for general distribution a booklet containing the complete draft of China's Revised Tariff. In addition to a tabulated classification of duty rates on all articles, the booklet gives the rules governing the administration of the tariff and an explanation of the methods to be used in settling questions regarding procedure.

Randall Steel Dumping Bodies

Randall Steel Dumping Bodies Co., of Chicago, Ill., manufactures a complete line of dumping bodies, including general purpose rear dumping bodies, two-way side dumping bodies, industrial truck trailer bodies, express truck bodies, tank bodies and coal chutes.

The following table shows the various sizes of end dumping bodies built by this company. The 1 and 1¼-yd. capacity bodies are designed especially for Ford trucks.

	Width	Length	Depth	Approx. Weight
1½ Yd. Cap.	48 in.	96 in.	15 in.	950 lb.
2 Yd. Cap.	48 in.	96 in.	20 in.	1000 lb.
2½ Yd. Cap.	54 in.	108 in.	20 in.	1200 lb.
3 Yd. Cap.	54 in.	108 in.	24 in.	1250 lb.
3½ Yd. Cap.	60 in.	108 in.	25¼ in.	1450 lb.
4 Yd. Cap.	60 in.	108 in.	28¾ in.	1500 lb.
1 Yd. Cap.	42 in.	79 in.	14 in.	600 lb.
1¼ Yd. Cap.	42 in.	79 in.	17 in.	650 lb.

The manufacturer calls particular attention to the shape of these bodies in that they meet all the requirements necessary for general purpose or express use. The tail gate opens at the top as well as at the bottom, while the dumping mechanism takes up, in addition to the length of the body, only 4 in. of space. All the dumping apparatus is underneath the body, so that it is absolutely protected from any material which otherwise might fall into the gears, while the body is being loaded.

These bodies are hand operated, as the reader will note from the illustrations. But very little effort is required to operate them; in fact, no more than required to operate the control levers on the truck.

The capacities given in the foregoing table are all at water level, so that the actual cubic carrying capacity when the load is crowned, as in loading dry or slightly damp bulb material, is greater than the given capacity. In view of the fact that the rear end of this body is very near to the ground when the body is in dumping position, it will actually dump cement in sacks without breaking the package. The tail gates are accurately fitted with a view to the carrying of fine-grained material. Steel covers can be supplied for any of these bodies, for the purpose of hauling garbage, etc.

The use of special clips does away with any necessity for drilling the chassis frame, in consequence of which the bodies can be mounted in a very short time. They can be furnished collapsible if desired, so that the sides, front and tail gate can be removed, thus leaving a steel platform which is convenient for carrying block stone and similar material. The fact that this body can be shipped in knock-down form and as the machinery and platform can also be separated, the shipment of this body by express or ocean transportation is decidedly economical.

The metal used in the construction of the 1 and 1¼-yard capacity (for Ford trucks) is No. 14 gage throughout. The metal in the other sizes runs from No. 14 to No. 10 gage, depending on the capacity of the body. The tail gates have a continuous angle frame 2 in. by 2 in. and cross rods, or hinge pins, ¾ in. round steel. The gate lock hooks and spreader attachment hooks are ½ in. thick by 1½ in. to 2 in. wide. The carrying wheel and traveling wheel shafting is 1 7-16 in. cold rolled steel. The bodies are furnished with a priming coat, either slate or olive finish.

Directions for operating: For bulk material (coal, sand, gravel, cement, brick, etc.), when ready to empty the load, the crank is put on the traveling shaft at either side and pressed forward to release the strain on the latch, thus giving a quarter turn to the latch shaft, the handle of which is shown at side of extreme front of the frame. This will unlock the body. The traveling shaft is then revolved to the rear as far as it will go, which will take from one and one-half to four turns of the crank, according to the length of the body and consequent distance of travel. The first half of distance traveled carries the body horizontally to the rear until the inner front edge of the yoke surrounding the rear shaft has taken position bearing against the front circumference of this rear shaft; this point is then the pivot on which the body turns. The balance of travel of the traveling shaft then allows the body to rise to the length of the side arms, which strike the trips on the sliding bars which operate the tail gate mechanism immediately before the body has reached its last position. This motion raises the lower tail gate hooks and the gate opens automatically, thus releasing the contents of the body. A lock, similar to the one at the front, is provided at the end of the shaft travel, immediately forward of the center shaft, which automatically locks the body at the extreme angle, thus preventing any remains of a sticky load (wet cement or clay), in the front of the body, from overbalancing and bringing down the front end. In a case of this kind, the material remaining in the body can usually be removed by shaking with a forward and backward movement of the crank.

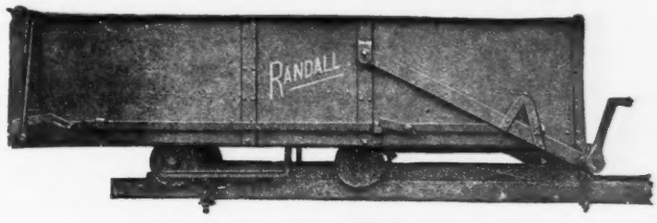
The body is returned to its original position by releasing it by a quarter turn of the center lock shaft. Turning the crank forward until the traveling shaft engages in the front lock places the body in its first position again, locked to the chassis, and the tail gate also locked. All of this is accomplished by a maximum of eight revolutions of the crank, requiring about fifteen seconds.

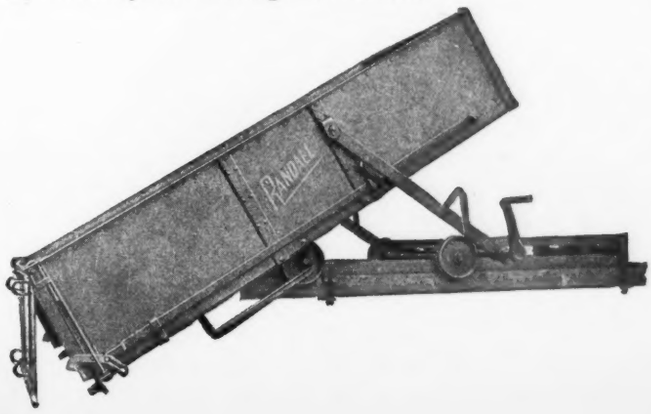
Buick to Make Carburetor

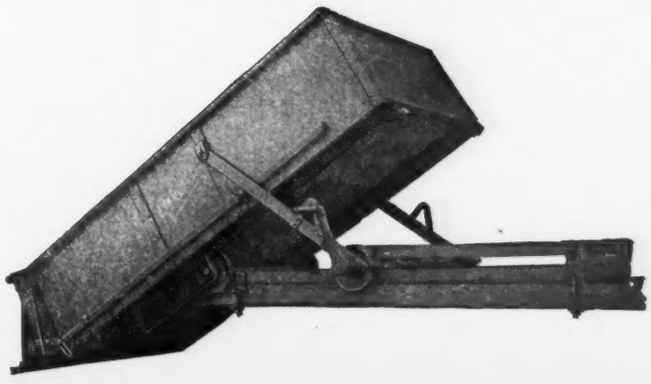
DETROIT, MICH., Aug. 6.—David and Thomas Buick, organizers of the Buick Motor Car Co., are about to place on the market a new carburetor of their own design. The carburetor is to be manufactured in the plant of the defunct Detroit-Wyandotte Motor Co. Manufacture began about August 1.

Haywood Tire & Equipment Co., Indianapolis, Ind., has recently placed on the market a new retread mold, known as Haywood's Silvur Lined Mold.

The Randall Steel Dumping Body in Various Positions.







The Service Unit Department and Its Advantages

By SHIRLEY WARE

THE service end of the motor truck business has long been the thorn in the lion's paw of that industry. The gulf that exists between dealer and customer has caused much thought in an endeavor to find some plan that will give satisfactory service to the user and legitimate profit to the dealer.

It is a known fact that a motor truck dealer cannot continuously accede to the service demands of his customers and realize the necessary profits to support a well equipped business. Some users know this to be true, but of course do not feel their position improved by the knowledge, and the motor truck dealers are willing to admit that at least the reasons behind the demands upon them are legitimate ones.

The difficulty, of course, lies in the tie-up occasioned by repair work when the truck is out of order. If a user realizes a net profit of $15 per day from his motor truck, it is only reasonable to suppose that he will complain when, the truck needing repairs, must be out of service for ten days or two weeks' time, and his complaint, so far as his own business suffering, even to the extent of cancelled business because of non-delivery, is justifiable.

On the other hand, the request that the user be supplied with a truck by the dealer while his machine is being repaired, is one that no company can fulfill without bearing the brunt in heavy losses, and, in the end, dissatisfied customers, for it would be impossible for any company to keep on hand a supply of trucks large enough to substitute for every repair job in the factory, to say nothing of the ridiculous cost of such an operation.

However, the seriousness of tieing up the user's business for such a period of time as will prove disastrous to him is something that all dealers have been eager to overcome, and many attempts have been made to bridge the existing difficulty. In this endeavor George Crane, of the Garford Motor Truck Co., Inc., Chicago Branch, has established a new department, which he has termed the "Service Unit Department." The plan is along the exchange idea and has proved a great saver in time and money to both the Garford Branch and its customers as well.

A room, adjoining the Repair Department, has been fitted with racks to accommodate motors, axles, springs, magnetos, carburetors, steering gears and other parts, in different sizes to suit the various style trucks manufactured by the Garford company. The original stock in this Service Unit Department was necessarily new, and, in order not to entail additional expense, was taken from the Stock Room and charged on the books accordingly.

When a truck is brought into the factory for repairs, the part in trouble is taken from the User's machine and thoroughly examined. An estimate is then made upon the cost of rebuilding the same and a like part from the Service Unit Department is installed in the machine at the estimated price, plus a labor charge for making the exchange. The part from the customer's truck is torn down completely and, in spare time, is rebuilt according to 1919 improvements, so that it is in just as good condition as a new part, and placed on the racks of the new department to await further exchange.

"We find," Mr. Crane states, "that the customer is primarily interested in getting his truck back in service as quickly as possible and for this reason the idea is working out fine.

"A customer telephoned by long distance the other day, informing us that his engine needed overhauling, but that he could not afford to be without it and asked what we could do for him. I explained our new service, and the truck came into the factory in the morning of one day, was equipped with a new steering wheel and engine, and left the evening of the following day."

Considering the profit which the customer realizes from his truck each day and the expense of an operator, whom he cannot lay-off in these times of uncertain labor, it can easily be seen that the cost to him is about one-half by the new system, to say nothing of eliminating the tie-up in deliveries.

Killing Two Flies With One Stroke

One of the incidents connected with the Wichita tractor demonstration was the overland trip of the "Minneapolis" 3½-ton truck, carrying a 12-20 hp. "Twin City" tractor, together with a three-bottom Oliver plow equipment, which left Minneapolis June 25 and reached Wichita July 12. The Minneapolis Steel & Machinery Co., Minneapolis, Minn., builders of the "Twin City" line, decided this would give them an excellent opportunity to show what their truck would do, and thus demonstrate the tractor.

Salesmen accompanied the outfit through their particular territory and stops were made at all the towns where their agents were located. It was not all "fair sailing" however, as the rains made the roads extremely heavy and the traveling difficult. One day they were stuck eight times, and at one time for eight hours, the four wheels being buried nearly out of sight, but in every case the truck was able to pull out with its own power. Anticipating roads of this kind, two 14-ft. pipes, three inches in diameter, were carried. These were used to good advantage by placing them between the double tires on the rear wheels, so that a fairly firm foundation was provided in getting out of miry places.

The truck was equipped with one of their 12-20 hp. engines, the same as is used in the tractor which it carried. No adjustments of any character were made enroute—gasoline and water being the only attention required. Harvey Hippe was in charge, assisted by R. Sandbrook.

Eisemann Magneto Corp., Brooklyn, N. Y., announces the appointment of the Cleveland Ignition Co., 1843-47 Euclid Ave., Cleveland, Ohio, as its official service station in Cleveland and Cuyahoga, Lorain, Medina, Summit, Portage, Geauga and Lake Counties.



Minneapolis Tractor Which Hauled Twin-City Tractor and Farming Implements From Minneapolis to the Wichita Demonstration

KEY OF ABBREVIATIONS

Used in the Specifications of Commercial Cars Listed on the Pages Following

Own—Own Make
Opt—Optional

Engine: Cont—Continental
Her—Hercules
H-Sp—Herschell-Spillman
Lite—Light Mfg. & Foundry Co.
Lyco—Lycoming
Ster—Sterling
Wau—Waukesha
Wis—Wisconsin

Valve Location: L—ELL-Head
T—TEE-Head
O—Overhead

How Cooled: C—Centrifugal Pump
G—Gear Pump
P—Water Pump
T—Thermo-Syphon
W—Water

Radiator (Make or Type): Bus—Bush
Can—Candler
EM—English-Mersick
Eur—Eureka
Fed—Fedders
Flex—Flexo
GO—G. & O.
Har—Harrison
Hovn—Hooven
Idl—Ideal
JMS—Jamestown
Lng—Long
McC—McCord
May—Mayo
MR—Marlin-Rockwell
Per—Perfex
R-T—Rome-Turney
Stan—Standard

C—Cellular
T—Tubular
H—Honeycomb

Tires: (Solid unless otherwise stated)
*—Pneumatic
†—Dual
S—Steel
T—Triple

Lubrication: C—Centrifugal Pump
Fo—Force-Feed
FG—Force and Gravity
FS—Force and Splash
Sp—Splash Feed
P—Water Pump

Carburetor: B&B—Ball & Ball
Cart—Carter
Ens—Ensign
Flch—Flechter
Holl—Holley
John—Johnson
Mar—Marvel
Mas—Master
Mill—Miller
Strm—Stromberg
Shk—Shakespeare
Sheb—Schebler
Spc—Special
Till—Tillotson
Zen—Zenith

Ignition System: (Make or Type)
At-Kt—Atwater Kent
Au-L—Auto-Lite
Bat—Battery
Bosh—Bosch
Berl—Berling
Conn—Connecticut
Delc—Delco
Dix—Dixie
Eism—Eisemann
King—Kingston
Mag—Magneto
NE—North East
POL—Prest-O-Lite
Sim—Simms
Spld—Splitdorf

Engine Starter: Au-L—Auto Lite
Bosh—Bosch
Bij—Bijur
Dyn—Dyneto
G&D—Gray & Davis
L-N—Leece-Neville
West—Westinghouse

Clutch: B—Borg & Beck
C—Cone
D—Disc
F—Fuller
G—Detroit Gear & Machine
H—Hartford
L—Brown-Lipe
M—Merchant & Evans (Hele-Shaw)
U—Muncie
W—Warner
O—Own

Transmission: B-Lipe—Brown-Lipe
Cott—Cotta
Covt—Covert
D-Sea—Driggs-Seabury
Det—Detroit
Durst—Durston
Full—Fuller
G-Lee—Grant-Lees
I-CI—Individual Clutch
MM—Mechanics Machine Co.
Munc—Muncie
Plan—Planetary
Prog—Progressive
Rock—Rockford
Selec—Selective
Warn—Warner

Drive: B—Bevel Gear
C—Chain
Ct—Concentric Spur
F—Friction
I—Internal Gear
O—Own
R—Roller
S—Shaft
SB—Spiral Bevel
Sp—Spur
W—Worm

Universal: Arv—Arvac
Bld—Blood Brothers
Hart—Hartford
K-B—Kinsler-Bennett
M—Merchant & Evans
Spic—Spicer
Ther—Thermoid
UM—Universal Machine Co.
UP—Universal Products Co.

Rear Axle: Cel—Celfor
Chic—Chicago
Cl—Clark
Emp—Empire
Rock—Rockford
Russ—Russel
Sals—Salisbury
Shel—Sheldon
Timk—Timken
Torb—Torbensen
W-M—Weston-Mott

Flot—Full Floating
½-Fl—Semi-Floating
¾-Fl—¾ Floating
⅞-Fl—⅞ Floating

Spring Suspension:
CC—Cleveland-Canton
Det—Detroit
GC—Garden City
IC—Iron City
Kal—Kalamazoo
Mar—Maremont
Math—Mather
Nat—National
Row—Rowland
Per—Perfection
Shel—Sheldon
SP—Spring Perch
Stan—Standard
Ster—Sterling
Tut—Tuthill
US—United States

Cant—Cantilever
Elip—Full Elliptic
S-El—Semi-Elliptic
¾-El—¾-Elliptic
S&C—Semi-Elliptic and Cantilever
S&¾—Semi-Elliptic and ¾-Elliptic

Steering Gear:
CAS—C. A. S. Products Co.
Dit—Ditwiler
Gem—Gemmer
Jac—Jacox
Lav—Lavine
W—Worm
Warn—Warner
Wohl—Wohlrab

Governor: C—Centrifugal
Cont—Continental
Del—Delaney
Dup—Duplex
McC—McCanna
Mer—Merrill
Mon—Monarch
Pier—Pierce
Rug—Ruggles
Simp—Simplex
Wau—Waukesha

EXTRA ABBREVIATIONS USED ON ELECTRICS

Battery: Exid—Exide
Edis—Edison
Phil—Philadelphia

Motor: Gn-El—General Electric Co.
West—Westinghouse

Controller: Gn-El—General Electric Co.
West—Westinghouse

Commercial Car Specifications—Corrected Monthly

The Specification, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. Gasoline Tractor-Trucks and Electric Commercial Cars Will be Found at the End of Gasoline Commercial Cars

(Where prices are not given they may be had on application to the manufacturer)

G. C. M. Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr.Cent of Weight on Rear Wheels
800 Pounds														**800 Pounds**														
Minnesota	800	320	Own	4	2¾x4	12.8	3	1/16	L	T	H	FS	Strom	At-K	.....	.....	Fric	3	Dead	Own	Ch	92	Tut	28x3	28x3	Own	.....	60
Overland	1777	900	Own	4	3⅜x5	18.2	4	1/16	L	T	C	FS	Till	Conn	Au-L	C	Selec	3	Own	B	¾-Fl	104	S&C	31x4*	31x4*	Own	.....	63.8
1000 Pounds														**1000 Pounds**														
Corliss 1919	1450	715	LeRoi	4	3 1/16x4½	16.9	4	....	....	....	T	FS	Sheb	Dix	Al-Ch	B	Covt	3	Arv	BG	½-Fl	103	Har	31x4*	31x4*	Wohl	.....	80
Dodge	1975	935	Own	4	3 7/16x4½	24	3	1/16	L	C	T	FS	Stew	NE	NE	D	Selec	3	Own	SB	Flot	114	Det	33x4	33x4	Own	.....	41
Ellsworth 25A	2100	....	Lyco	4	3¼x5	18	3	1/16	L	C	T	Sp	Cart	Conn	App	C	GLee	3	Stan	BG	Gem	108	Shel	30x3½*	30x3½*	Fos	.....	70
Indiana T	3400	2150	Wau	4	3¾x5¼	22.5	3	¼	L	C	T	Sp	Strm	Eism	.....	B	Selec	3	Acme	W	½-Fl	135	S-El	34x3½	34x4	Wohl	Wau	65
Vim 21	1900	945	Own	4	3 x4½	14.4	3	3/16	L	T	McC	CSp	Zen	Dix	.....	C	Selec	3	Spic	B	Own	108	Shel	31x4*	31x4*	Jac	.....	.....
1200 Pounds														**1200 Pounds**														
Overland	2179	....	Own	4	4 1/16x4½	27.2	2	⅜	L	T	C	FS	Till	Conn	Au-L	C	Selec	3	Own	SB	¾-Fl	106	S-El	33x4½*	33x4½*	Own	.....	68.8
1500 Pounds														**1500 Pounds**														
Atlas 19	2320	1135	Lyco	4	3½x5	19.6	3	1/16	L	T	H	Sp	Cart	Remy	Remy	B	Selec	3	Arc	B	Hess	118	Row	32x4*	32x4*	CAS	.....	60
Diehl A	2400	1575	Cont	4	3½x5	19.6	3	....	....	T	H	FS	Zen	Bosch	.....	B	Durst	3	K-B	I	Torb	115	Mar	34x4½*	35x5*	Jac	.....	90
Dispatch G	2200	1200	Wis	4	3¾x5	22.5	3	1/16	L	T	C	Fo	Rayf	Bosch	USL	O	Own	4	Bld	I	Dead	120	Tut	34x4*	34x4*	W	.....	50
G. M. C. 16	2760	1495	Cont	4	3¾x5	22.5	3	1/16	L	C	McC	FS	Mar	Eism	.....	D	Selec	3	UM	B	WM	132	Det	35x5*	35x5*	Jac	Mon	67
Grant 12	2300	1125	H-Sp	4	3¼x5	16.9	3	¼	L	C	Fed	FS	Cart	Spld	Bij	B	GLee	3	Arv	I	Torb	115	Per	32x4*	32x4*	Dit	.....	65
International H	2800	1550	Own	4	3½x5¼	19.6	3	1/16	L	C	T	FS	Holl	Bosch	Own	D	Own	3	Own	I	Own	115	.....	36x3	36x3½	Ross	Own	50
Old Hickory M	2100	995	Lyco	4	3¼x5	16.9	3	1/16	L	C	T	Sp	Cart	Cov	Dyn	C	Selec	3	Own	B	½-Fl	112	.....	33x4*	33x4*	W	.....	60
Rainier	2350	1750	Cont	4	3½x5	19.6	3	1/16	....	T	Har	.....	Zen	Mag	.....	L	B-Li	...	Hart	.....	Timk	125	Per	34x4½	34x4½	.....	Mon	66⅔
Reo F	2525	1250	Own	4	4 1/16x4½	27.2	3	1/16	L	C	T	Own	Sp	John	Remy	Remy	O	Own	3	Own	B	Own	128	Penn	34x4½*	34x4½*	Own	.....	62½
Shaw M-2	....	1650	Cont	4	3¾x5	22.4	3	1/16	L	T	T	FS	Zen	Bosch	.....	D	B-Li	3	Spic	BG	Timk	116	Per	32x4*	32x4*	Gem	.....	65
Stewart 11	2400	1195	LRoi	4	3 1/16x4½	15.6	3	1/16	L	R	T	C	FS	Zen	Eism	.....	M	MM	3	Hart	I	IC	110	Det	32x4	32x4	CAS	LeRoi	66¾
Texan Cx 36	....	....	GBS	4	3¾x4½	22.5	3	1/16	L	T	H	FS	Mill	Delc	Au-L	D	GLee	3	UP	B	Flot	115	.....	33x4	34x4	.....	.....	.....
Vim 26	2450	2200	Own	4	3 x4½	14.4	3	1/16	L	T	T	McC	CSp	Zen	Dix	.....	C	Selec	3	Spic	B	Own	127	Shel	32x4½*	32x4½*	Jac	.....	.....
White G B B E	2960	2400	Own	4	3¾x5⅛	22.5	3	....	L	C	C	FS	Own	Mag	.....	D	Selec	4	Own	B	Own	133	.....	34x4½*	34x4½*	Own	.....	.....
1 Ton														**1 Ton**														
Acason R	3650	....	Wau	4	3¾x5¼	22.5	3	¼	L	P	T	Can	Sp	Sheb	Eism	.....	F	Full	3	Bld	W	Timk	144	Det	36x3½	36x5	Ross	Wau	73
Acme B	3376	1950	Cont	4	3¾x5	22.5	3	1/16	L	T	L	GO	FS	Rayf	Eism	G&D	B	Cott	3	Bld	W	Timk	130	Det.	34x3½	34x5	Ross	Dup	80
All-American A-A	2600	1295	H-Sp	4	3¼x5	16.9	3	1/16	L	T	T	Stan	FS	Strm	Simms	.....	B	GLee	3	UP	I	Torb	130	Det	33x4*	32x4	Ross	.....	75
Beck-Hawkeye A	2800	1550	Cont	4	3½x5	....	....	....	....	T	H	Sp	Strm	Bosch	.....	F	Full	3	Bld	I	½-Fl	124	Hig	34x3	34x4	Lav	Pier	75
Bessemer G	2900	1575	Cont	4	3½x5	19.6	3	1/16	L	T	C	FS	Zen	Bosch	.....	F	Full	3	Arv	I	Torb	124	Per	34x3½	34x4	Ross	.....	57
Briscoe T-34	....	....	Own	4	3⅞x5	18.9	3	1/16	L	O	C	FS	Buick	Bat	Au-L	C	Own	3	UM	....	Russ	121	.....	33x4	34x3½	Lav	.....	.....
Chevrolet T	2840	1325	Own	4	3 1/16x5¼	22.5	3	1/16	L	O	T	FS	Zen	Remy	Au-L	C	Warn	3	Arv	W	½-Fl	125	Hess	31x4	31x4	Warn	Mon	.....
Columbia F	2800	1750	Cont	4	3¾x5	22.5	3	1/16	L	C	T	FS	Shk	Dix	.....	B	Covt	3	Spic	I	Russ	126	Per	34x3½	34x4	Own	Pier	70
Clydesdale 32	3400	....	Cont	4	3¾x5	22.5	3	1/16	R	T	T	Sp	Zen	Bosch	.....	L	B-Li	3	Spic	W	Timk	144	Stan	34x3½	34x5	Ross	Own	.....
Commerce E Ch	2900	1500	Cont	4	3¾x5	22.5	3	1/16	L	T	L	EM	Sp	Zen	Eism	Imp	C	Selec	3	Spic	I	Torb	126	Det	34x3	34x4	Jac	.....	80
Conestoga-20	3300	1850	Cont	4	3½x5	19.6	3	1/16	L	T	T		Sp	.....	.....	.....	F	Full	3	.....	W	Wis	128	S-El	34x3½	34x5	Ross	.....	90
Corbitt E	3050	2150	Cont	4	3¾x5⅛	22.5	4	1/16	L	C	T	Idl	Sp	Strm	Eism	G&D	D	Full	3	.....	W	Shel	130	Shel	34x3½	34x4	Lav	Pier	80
Dart E	3200	2100	Buda	4	3¾x5⅛	22.5	3	¼	L	C	T		Sp	Zen	Eism	.....	F	Full	3	Arv	W	Timk	130	Per	34x3½	34x5	Ross	.....	80
Day-Elder A	3000	1775	Cont	4	3½x5	19.6	3	1/16	L	T	T	Bus	FS	Zen	Berl	.....	D	Covt	3	Hart	W	Wis	128	Shel	34x3	34x4	Ross	.....	70
Dearborn A	2100	1175	GBS	4	3¾x4¼	22.5	3	1/16	L	T	T		Sp	Strm	Dix	.....	GB	GLee	3	Arv	Ch	CC	125	C-C	30x3½*	32x3½	Dit	.....	90
Denby 12	3100	1650	Cont	4	3½x5	19.6	3	1/16	R	T	L		Sp	Strm	Eism	.....	F	Full	3	UP	I	Russ	124	Det	34x3	34x4	Ross	Mon	73
Diamond T-J 5	3050	2125	.....	4	3½x5	19.6	3	1/16	L	T	T		FS	Strm	Bosch	.....	L	B-Li	3	Spic	W	Timk	126	Math	36x3	36x4	Gem	Pier	.....
Douglas C	2750	1700	Buda	4	3½x5⅛	22.5	3	....	L	T	Own	FS	Sheb	Eism	.....	F	Full	3	Arv	Arv	Torb	122	Own	34x4½	35x5	Ross	.....	65
Famous B-10	3000	1690	Cont	4	3½x5	19.6	3	1/16	L	T	T		Sp	Strm	Eism	.....	F	Full	3	Bear	I	CI	120	Det	36x3½	36x4	Ross	Mon	75
Federal S	3500	....	Cont	4	3¾x5	22.5	3	1/16	R	C	T		FS	Zen	Eism	.....	B	Own	3	.....	W	Timk	132	Math	35x5*	36x6*	Gem	Pharo	75
Ford T	1450	590	Own	4	3¾x4	22.5	3	¼	L	T	T		SG	Holl	Mag	.....	D	Plan	2	.....	W	½-Fl	124	.....	30x3½*	32x4½*	.....	.....	.....
Forschler A	3450	2100	Cont	4	3½x5	19.6	3	1/16	L	C	C	Own	FS	Zen	Bosch	Opt	F	Full	3	Hart	W	Shel	120	Own	34x3	34x4	Ross	Dup	.....

Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr.Cent of Weight on Rear Wheels
1 Ton—Continued																												
Garford 75 C	3900	2250	Buda	4	3¾x5½	22.5	3	1/4	L	C	T	Sp	Rayf	Spld	.....	L	B-Li	3	Spic	W	Timk	128	Per	34x4½*	36x4	Ross	Simp	.....
Gary G	4200	....	.....	....	4¼x5½	.....	.....	.....	.....	C	.....	Fo	Strm	Eism	.....	.....	Selec	...	Ray	W	½-Fl	144	S-El	36x3½	36x5	.....	.....	.....
Giant 15	2950	1950	Cont	4	3½x5	19.6	3	1/4	L	T	Idl	FS	Sheb	Eism	.....	W	Warn	3	Spic	W	Timk	138	Math	34x3½	34x5	Jac	.....	94
Hahn G	3600	....	Cont	4	3½x5	19.6	3	1/4	L	T	Idl	Fo	Strm	Mag	.....	D	Det	3	Spic	I	Torb	130	Del	34x3	34x4	Lay	.....	65
Hahn C	4200	....	Cont	4	4 1/16x5¼	30	4	1/4	L	C	Own	Fo	Strm	Bosch	.....	D	B-Li	3	Spic	W	Timk	136	Del	36x3½	36x5	Ross	Pier	65
Higrade A 18	2900	2100	Cont	4	3½x5	19.6	3	1/4	L	T	Per	FS	Zen	Sim	L-N	F	Full	3	Bld	W	Shel	115	Per	35x5	35x5	Lav	Dup	66
Hoover 15-B	2425	1625	Cont	4	3½x5	19.6	3	1/4	L	T	Can	Fo	Sheb	Dix	.....	F	Full	3	Acme	W	Shel	120	Shel	32x4	33x4½	Lav	.....	80
Independent F	2850	1685	Cont	4	3½x5	19.6	3	.....	L	C	FS	Zen	Eism	.....	.....	F	Full	3	.....	W	Stan	128	S-El	34x3	34x4	Wohl	.....	70
International F	3000	1850	Own	4	3½x5¼	19.6	3	1/4	L	T	C	FS	Holl	Bosch	Own	D	Own	3	Own	I	Own	128	.....	36x3½	36x4	Ross	Own	50
Jones 31 A	3400	1395	Cont	4	3½x5	19.6	3	1/4	L	T	C	Fo	Strm	Eism	.....	B	Covt	3	Arv	I	Russ	130	Penn	34x3½	34x4	Warn	Pier	80
Menominee-HT	....	1890	Cont	4	3¾x5	22.5	3	1/4	L	T	C	Sp	Strm	Eism	.....	F	Selec	3	Spic	W	Timk	130	Tut	34x3½	34x5	Ross	Mon	80
Myers 60	2850	1545	Lyco	4	3½x5	19.6	3	1/4	L	T	C	FS	Zen	Swis	.....	D	MM	3	UM	W	Chic	130	C-C	34x3½	34x4	CAS	.....	75
Napoleon 9	3400	1285	Gray	4	3½x5	19.6	3	1/4	O	T	C	Sp	Strm	Conn	Au-L	F	Full	3	UP	.....	Cl	132	.....	32x3½	32x4	Gem	.....	65
Nash 2018	3400	1650	Own	4	3¾x5¼	22.5	4	1/4	L	T	T	Fo	Strm	Eism	.....	B	Selec	3	Own	I	Celf	130	Stan	34x3	34x4	Jac	Simp	67.5
Nelson & Le Moon F1	2900	2000	Cont	4	3¾x5¼	22.5	3	1/4	L	C	T	Sp	Strm	Bosch	W	L	B-Li	3	Own	W	Timk	...	Tut	36x3	36x4	Lav	Mon	80
Norwalk	1650	1595	Lyco	4	3½x5	28.5	3	1/4	L	T	C	Sp	Zen	Dele	Dyn	D	MM	3	UM	W	½-Fl	130	C-C	34x4*	34x4	CAS	.....	90
Ogden A1	3400	2095	Cont	4	3¾x5	22.5	3	1/4	L	T	C	FS	Rayf	Bosch	.....	B	B-Li	3	Acme	W	Timk	136	Tut	36x3	36x4	Gem	Pier	70
Old Hickory	3470	....	Cont	4	4¾x5	22.5	3	1/4	L	T	T	Fo	Strm	Mag	.....	B	Selec	3	Bld	W	½-Fl	135	S-El	36x3½	36x4	W	Pier	75
Oneida A	4320	2290	Cont	4	3¾x5¼	22.5	3	1/4	L	C	L	FS	Strm	Bosch	Opt	M	Cott	3	Spic	W	Timk	144	Math	36x3½	36x5	Ross	Pier	82
Panhard	2810	1195	Gray	4	3½x5	19.6	3	1/4	O	C	CAS	Sp	Strm	Au-L	Opt	D	Full	3	UP	I	Torb	130	Det	32x3½*	32x3½	Lav	.....	80
Piedmont O	....	....	Lyco	4	3½x5	19.6	3	1/4	L	T	Stan	Fo	Cart	Bat	Dyn	B	Selec	3	Hart	W	Emp	130	S-El	33x4*	33x4	.....	.....	.....
Rainier R-9	2800	1875	Cont	4	3½x5	19.6	3	1/4	L	T	Har	FS	Zen	Sim	.....	L	B-Li	3	Hart	W	½-Fl	125	Per	34x4½	34x4½	Lav	Mon	80
Republic 10	2850	1555	Cont	4	3¾x5	22.5	3	1/4	L	T	C	FS	Strm	Eism	.....	D	Full	3	Arv	I	Torb	124	S-El	34x3	34x4	Jac	Rug	.....
Royal	....	2400	Wis	4	3¼x5	16.9	....	....	....	T	.....	.....	Strm	Bosch	Opt	B	Own	3	Own	W	Timk	128	Mer	34x4	34x5	Ross	Mon	.....
Sandow G	3000	1795	Cont	4	3½x5	19.6	3	1/4	L	T	T	FS	Strm	Eism	.....	D	Full	3	UM	W	Shel	120	GC	34x3½	34x5	Ross	.....	66
Service 220	3470	2100	Buda	4	3½x5½	19.6	3	1/4	L	T	T	FS	Strm	Eism	.....	D	Selec	3	Arv	W	Timk	137	.....	34x3½	34x5	Ross	.....	64
Signal F	4395	2400	Cont	4	4 1/16x5¼	27.2	3	1/4	L	C	McC	FS	Strm	Eism	.....	L	B-Li	4	Spic	W	Timk	144	Per	34x3½	36x5	Lav	Pier	80
Standard 56	3900	1900	Cont	4	3¾x5	22.5	3	1/4	L	C	T	FS	Strm	Eism	.....	D	B-Li	3	Spic	W	Timk	134	.....	34x3½	34x4	Ross	Mon	75
Stewart 8	2820	1650	Cont	4	3½x5	19.6	3	1/4	R	T	T	FS	Zen	Eism	.....	B	Durst	3	Hart	I	IG	130	Det	34x3½	34x4	Gem	.....	70
Superior A	2680	1600	Gray	4	3½x5	19.6	3	1/4	O	T	Idl	.....	Strm	Eism	.....	F	Full	3	Arv	I	Torb	124	Tut	34x4½*	34x4*	CAS	Mon	.....
Transport 20	3070	1600	Cont	4	4¾x5	22.5	3	1/4	L	T	C	FS	Strm	Eism	.....	F	Full	3	Ther	I	Cl	130	Det	34x3½	35x4	Jac	Simp	70
Vim 25	2800	2195	Her	4	3¾x5 1/16	22.5	3	1/4	L	C	McC	C	Zen	Dix	.....	D	Selec	3	Spic	W	Shel	120	Shel	35x5*	35x5*	Jac	.....	.....
Wilson F	3150	1750	Cont	4	3½x5	19.6	3	1/16	L	T	H	FS	Strm	Eism	.....	D	Covt	3	Bld	W	Timk	124	Shel	35x5*	35x5*	Ross	Pier	75
1¼ Ton																												
Collier 16	2600	1375	Lyco	4	3½x5	19.6	3	1/4	L	T	Jms	Sp	Zen	Conn	Au-L	B	GLee	3	Ther	B	Sals	128	Ster	33x4½	32x4½	Die	.....	50
Commerce EP	3200	1895	Cont	4	3¾x5	22.5	3	1/4	L	T	L	Sp	Zen	Eism	Imp	C	Selec	3	Spic	I	Torb	134	Det	36x6*	36x6*	Jac	.....	80
Koehler K	3000	1450	Own	4	3½x5	19.6	3	1/4	L	T	T	FS	Strm	Eism	.....	MM	MM	3	K-B	I	Torb	129	.....	34x3	34x4	Own	Mon	65
1½ Ton																												
Acason RB	3850	....	Wau	4	3¾x5¼	22.5	3	1/4	L	P	Can	Sp	Sheb	Eism	.....	F	Full	3	Bld	W	Timk	144	Det	36x3½	36x6	Ross	Wau	77
Atterbury 7R	4770	2575	Cont	4	4 1/16x5¼	27.2	3	1/4	L	C	T	Sp	Zen	Eism	.....	L	B-Li	4	Spic	W	Timk	140	SP	36x3½	36x5	Gem	Mon	96.5
Beck-Hawkeye B	3200	1950	Cont	4	3¾x5	.....	.....	.....	.....	T	H	Sp	Strm	Bosch	.....	F	Full	3	Bld	I	½-Fl	144	Hig	34x3½	34x5	Lav	Pier	75
Bessemer H	3500	1945	Cont	4	3¾x5	22.5	3	1/4	L	T	C	FS	Zen	Bosch	.....	B	B-Li	3	Arv	I	Torb	144	Per	36x3½	36x5	Ross	.....	63
Bethlehem D	3300	1965	Own	4	3¾x4½	22.5	3	1/4	L	T	Fed	FS	Sheb	Bat	G&D	B	Det	3	UP	I	Russ	136	Shel	34x3½	34x5	Lav	Mon	85
Brinton F	4300	2500	Cont	4	4 1/16x5¼	27.2	3	1/4	L	T	T	Fo	Strm	Bosch	.....	D	Selec	3	Spic	W	Flot	150	.....	34x4	34x5	Ross	Pier	.....
Brockway S	3800	2100	Cont	4	3¾x5	22.5	3	1/4	L	T	Bus	FS	Sheb	Eism	.....	L	B-Li	3	Spic	W	Shel	140	Mer	36x3½	36x5	Gem	Opt	70
Clydesdale 42	....	....	Cont	4	3¾x5	22.5	3	1/4	R	T	T	Sp	Zen	Bosch	.....	L	B-Li	3	Spic	W	Timk	146	Stan	36x3½	36x6	Ross	Own	.....
Comet 1½	2898	1750	Lyco	4	3½x5	19.6	4	1/4	L	C	Stan	FS	Cart	Au-L	Dyn	B	Munc	3	UP	W	Stan	130	Mar	34x4*	34x4	CAS	.....	85
Concord A	4200	2550	Buda	4	3¾x5½	22.5	3	1/4	L	C	T	Sp	Zen	Eism	.....	L	B-Li	3	Spic	W	Timk	140	Per	36x3½	36x5	Ross	Mon	70
Corbitt D	3890	2400	Cont	4	3¾x5	22.5	3	1/4	L	C	McC	FS	Strm	Eism	.....	D	Full	3	.....	W	Shel	138	Shel	36x3½	36x5	Ross	Pier	75
Day-Elder B	3300	2075	Cont	4	3¾x5	22.5	3	1/4	L	T	Bus	FS	Zen	Berl	.....	D	Covt	3	Hart	W	Wis	144	Shel	34x3½	34x5	Ross	.....	72
Dearborn F	3280	1980	Cont	4	3½x5	19.6	3	1/4	L	T	T	Sp	Strm	Bosch	.....	F	Full	3	Arv	W	Stan	126	Tut	34x4	34x5	Lav	.....	80
Defiance B	3200	1795	Cont	4	3¾x5	22.5	3	1/4	R	T	Per	FS	Strm	Eism	.....	B	GLee	3	Arv	I	Torb	135	Det	34x3½	34x5	Dit	Mon	85
Diamond T-J4	3700	2550	.....	4	3¾x5	22.5	3	1/4	L	T	T	FS	Strm	Bosch	.....	L	B-Li	3	Spic	W	Timk	127	Math	36x3½	36x5	Gem	Pier	.....
Douglas D	3100	2100	Buda	4	4 1/16x5½	27.2	3	1/4	L	C	Own	FS	Sheb	Eism	.....	F	Full	3	Arv	Arv	Torb	127	Own	34x3½	34x5	Ross	Pier	65
Famous B-12	3600	2250	Cont	4	3¾x5	22.5	3	1/4	L	C	T	Sp	Strm	Eism	.....	F	Full	3	Bear	I	Cl	138	Det	36x3½	36x5	Ross	Mon	75
Federal T	4250	2350	Cont	4	4 1/16x5¼	27.2	3	1/4	L	C	T	Sp	Zen	Eism	.....	B	Own	4	Spic	W	Timk	144	Math	36x3½	36x5	Gem	Mon	76
Forschler A-X	3670	2375	Cont	4	3½x5	19.6	3	1/4	L	C	Own	FS	Zen	Bosch	Opt	F	Full	3	Hart	W	Shel	120	Own	34x3½	34x4	Ross	Dup	.....
Fulton C	3340	2150	H-Sp	4	3¼x5	18.2	3	1/4	L	T	GO	FS	Cart	Sim	.....	B	Dur	3	UM	I	Russ	137	S-El	34x4	34x6	Lav	.....	68
Garford 66 B	4180	2500	Buda	4	3¾x5½	22.5	3	1/4	L	C	T	Sp	Rayf	Spld	.....	L	Own	4	Spic	W	Timk	144	Per	36x3½	36x5	Ross	Simp	.....
Gary GT	4200	2025	Buda	4	4¼x5½	28.9	3	1/4	L	C	T	Fo	Strm	Eism	.....	D	Selec	3	.....	.....	Timk	144	S-El	34x3½	34x6	Ross	.....	.....
Gersix M	4300	2650	Buda	4	4 x5½	25.6	3	1/4	L	C	I	Fo	Strm	Bosch	.. ..	B	Cott	3	Bld	W	Own	142	Tut	36x3½	36x6	Ross	Mon	70
Giant 14	3600	2250	Cont	4	3½x5	19.6	3	1/4	L	C	C	FS	Sheb	Eism	.....	W	Warn	3	Spic	W	Timk	138	Math	34x3½	34x5	Jac	Pier	94
G. M. C. 31 A	4110	2395	Cont	4	3¾x5	22.5	3	1/4	L	C	McC	FS	Mar	Eism	.....	D	Selec	4	UM	W	Timk	130	Det	36x3½	36x5	Lav	Mon	74
G. M. C. 31 B	4150	2395	Cont	4	3¾x5	22.5	3	1/4	L	C	McC	FS	Mar	Eism	.....	D	Selec	4	UM	W	Timk	144	Det	36x3½	36x5	Lav	Mon	74
Gramm-Bernstein 15	3700	1895	Cont	4	3¾x5	22.5	3	1/4	R	T	T	Sp	Strm	NE	.....	D	Selec	3	Arv	I	Cl	138	.....	36x3½	36x5	Ross	.....	.....
Grant 10	3000	1885	Cont	4	3¾x5	22.5	3	1/4	L	T	Fed	FS	Cart	Spld	Remy	B	GLee	3	Arv	I	Torb	124	Per	34x4½*	34x5	Jac	Pier	65
Grant 11	3100	1935	Cont	4	3¾x5	22.5	3	1/4	L	T	Fed	FS	Cart	Spld	Remy	B	GLee	3	Arv	I	Torb	140	Per	34x4½*	34x5	Jac	Pier	65
Hahn D	4600	....	Cont	4	4 1/16x5	30	4	1/4	L	C	Own	Fo	Strm	Bosch	.....	D	B-Li	3	Spic	W	Timk	142	Del	36x3½	36x6	Ross	Pier	65
Harvey W E A	3850	2350	Buda	4	4 1/16x5½	27.2	4	1/4	L	P	T	Fo	Zen	Bosch	.....	F	Full	3	Arv	W	Shel	128	Shel	34x3½	34x5	Ross	Mon	60
Hawkeye K	3400	1995	Buda	4	3¾x5½	22.5	3	1/16	L	C	C	FS	Zen	Eism	.....	F	Full	3	Hart	I	Cl	148	Det	34x3½	34x5	Gem	Simp	70

1 Ton—Continued

1¼ Ton

1½ Ton

Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr. Cent of Weight on Rear Wheels
1½ Ton—Continued																												
Huffman B	3200	1695	Cont	4	3¾x5	22.5	3	1/8	....	T	C	Fo	Zen	Dix	Imp	F	Full	3	.....	H	Stan	140	Per	34x3½	34x5	Lav	.....	85
Huffman C	3350	1495	Cont	4	3¾x5	22.5	3	1/8	....	T	C	Fo	Zen	Dix	Imp	F	Full	3	.....	H	Torb	140	Per	34x3½	34x5	Lav	.....	85
Hurlburt	4300	2850	Buda	4	4 x5½	25.6	3	....	L	T	T	S	Flch	Eism	.....	D	B-Li	3	Spic	W	Flot	148	Per	34x4	34x5	Ross	Dup	.....
Indiana Q	4200	2600	Rut	4	4 1/8x5½	27.2	3	1/4	L	C	T	Fo	Strm	Eism	.....	B	Selec	4	Acme	W	1½-Fl	144	S-El	36x3½	36x5	Wohl	Pier	68½
International K	3400	2200	Own	4	3½x5¼	19.6	3	1/8	L	C	T	FS	Holl	Bosch	Own	D	Own	3	Own	I	Own	128	.....	36x3½	36x5	Ross	Own	50
Kalamazoo G	3940	2500	Cont	4	3¾x5	22.5	3	1/4	L	C	T	Hvn	FS	Strm	Conn	Dyn..	F	Full	4	Acme	W	Wis	144	Kal	34x4	34x5	Ross	Pier	.....
Kelly-Springfield K 31	4590	2750	Own	4	3¾x5¼	22.5	3	1/4	L	C	C	Fed	Fo	Zen	Eism	West	C	Covt	3	Own	C	Dead	144	Per	36x3½	36x6	Gem	Own	89
Kelly-Springfield K 32	4685	2750	Own	4	3¾x5¼	22.5	3	1/4	L	C	C	Fed	Fo	Zen	Eism	West	C	Covt	3	Spic	W	1½-Fl	144	Per	36x3½	36x6	Gem	Own	89
Kimball A	....	....	Wis	4	4 x6	25.6	3	1/4	L	C	C	Flex	FS	Mas	Bosch	.....	L	Selec	4	Spic	W	Shel	126	US	36x3½	36x5	Lav	Dup	80
Kissel-Utility	3600	2275	Own	4	3⅞x5½	24.1	3	1/8	L	C	C	McC	Sp	Strm	Eism	.....	W	Warn	3	Spic	W	Shel	152	Math	36x3½	36x5	Jac	Pier	80
Larabee-Deyo U	3600	2150	Cont	4	3¾x5	22.5	3	1/8	L	C	C	Bus	Sp	Sheb	Bosch	.....	L	B-Li	3	M	W	Shel	138	Mer	34x3½	34x5	Ross	Pier	.....
Maccar L	4450	2750	Cont	4	4 1/8x5¼	27.2	3	1/8	L	C	C	Own	FS	Strm	Bosch	.....	L	B-Li	3	Spic	W	Timk	150	Mer	36x4	36x5	Ross	Pier	70
Mack AB	4800	2800	Own	4	4 x5	25.6	3	....	L	C	C	H	FS	Strm	Dix	.....	D	Selec	4	.....	C	Dead	Op	.....	36x3½†	.....	Own	.....	46
Manly 30	.....	2050	Wau	4	3¾x5¼	22.5	3	1/4	L	C	T	T	Sp	Zen	Eism	.....	F	Selec	3	Ther	W	1½-Fl	144	Shel	36x4	36x5	Lav	Wau	.....
Master Junior JW	3800	1990	Buda	4	4 1/8x5½	27.2	3	1/8	L	C	C	T	Sp	Mas	Eism	.....	D	Full	3	Arv	W	Timk	142	Det	34x3½	34x5	Ross	McC	78
Master Junior JI	3900	2090	Buda	4	4 1/8x5½	27.2	3	1/8	L	C	T	T	Sp	Mas	Eism	.....	D	Full	3	Arv	IG	Torb	142	Det	34x3½	34x5	Ross	McC	78
Maxwell	2385	1185	Own	4	3⅝x4½	21.3	3	1/8	L	C	T	C	FS	John	At-K	.....	C	Selec	3	Own	W	1½-Fl	124	Shel	32x3	32x4	Own	.....	50
Menominee H	....	2475	Cont	4	3¾x5¼	22.5	3	1/8	L	C	C	T	Sp	Strm	Eism	.....	F	Selec	3	Spic	W	Timk	144	Tut	36x3½	36x5	Ross	Mon	80
Moreland 19B	4150	2930	Cont	4	4 1/8x5¼	27.2	3	1/8	L	C	C	C	Fo	Mill	Dix	.....	D	Selec	4	Ther	W	Timk	126	US	36x3½	36x5	Ross	.....	.....
Myers 80	3000	1875	Lyco	4	3½x5	19.6	3	1/8	L	C	T	T	Sp	Zen	Swis	.....	B	GLee	3	UM	W	Chic	130	C-C	34x3½	34x5	CAS	.....	75
Napoleon 11	3450	1485	Gray	4	3½x5	19.6	3	1/4	L	O	T	T	Sp	Strm	Conn	Au-L	F	Full	3	UP	I	IG	132	S-El	34x4	34x5	Lav	.....	65
Nelson & Le Moon F1½	3400	2425	Cont	4	3¾x5¼	22.5	3	1/8	L	C	T	T	Sp	Strm	Bosch	West	L	B-Li	3	Own	W	Timk	...	Tut	36x3½	36x5	Lav	Mon	80
Noble NWI	3950	2450	Cont	4	3¾x5	22.5	3	1/8	L	R	T	T	FS	Strm	Eism	G&D	F	Full	3	Acme	W	Shel	144	Kal	36x3½	36x5	Ross	.....	80
Norwalk	1850	1925	Lyco	4	3½x5	19.6	3	1/8	L	C	T	C	FS	Zen	Delc	.....	B	GLee	3	UM	W	Stan	130	C-C	34x3½	34x5	CAS	.....	75
O. K. 1½ T	3850	2450	Rut	4	4 1/8x5½	27.2	3	1/8	L	C	T	C	FS	Cart	Dix	.....	D	Selec	3	Hart	W	Stan	146	Tut	36x4	36x5	Ross	Pier	85
Old Reliable WA	4150	2350	Wis	4	4 x6	27.2	3	1/8	L	C	C	L	FS	Strm	Bosch	Opt	M	B-Li	3	Spic	W	Shel	130	Shel	34x3½	36x6	Ross	Pier	82
Oneida B	5280	2650	Cont	4	4 1/8x5¼	27.2	3	1/4	L	L	T	L	Fo	Stan	Bosch	Opt	M	Cott	3	Spic	W	Timk	144	Math	36x3½	36x6	Ross	Pier	.....
Packard 1½ E	4640	3200	Own	4	4 x5½	25.6	3	1/4	L	C	C	T	Fo	Own	Dix	Bij	D	Selec	4	Spic	W	Flot	144	.....	34x3½	34x3½†	Own	Own	45.9
Panhard B	3010	1395	Gray	4	3½x5	19.6	3	1/8	O	C	T	CAS	Sp	Strm	Au-L	Opt	D	Full	3	UP	I	Torb	130	Det	32x3½	32x4	Lav	.....	80
Patriot Lincoln	3400	2150	Cont	4	3¾x5	22.5	3	1/8	L	T	T	Own	FS	Strm	Bosch	.....	D	Selec	3	Ther	H	IG	135	S-El	34x3½	34x5	W	Pier	75
Piedmont	....	....	Lyco	4	3½x5	19.6	3	1/8	L	T	T	Stan	Fo	Cart	Bat	Dyn	B	Selec	3	Hart	W	Emp	140	S-El	.....	.....	.....	.....	.....
Rainier R-6	3100	1975	Cont	4	3½x5	19.6	3	1/8	L	T	T	Har	FS	Zen	Sim	.....	L	B-Li	3	Hart	W	1½-Fl	133	Per	34x3	34x4	Lav	Mon	80
Reliance	4200	2500	Buda	4	4 1/8x5½	27.2	3	1/4	L	P	T	T	FS	Strm	Bosch	.....	F	Full	3	Hart	E	Dead	150	Shel	36x3½	36x5	Ross	Pier	.....
Republic 11X	3200	1885	Cont	4	3¾x5	22.5	3	1/8	L	C	T	C	FS	Strm	Eism	.....	D	Full	3	Arv	I	Torb	144	S-El	34x3½	34x5	Jac	Rug	.....
Royal	....	2800	Wis	4	3¾x5	22.5	....	..	....	C	T	T	....	Strm	Bosch	Opt	D	Own	...	Own	W	Timk	128	Mer	34x4	34x5	Ross	.....	67
Sandow CG	3300	2090	Cont	4	3½x5	19.6	3	1/8	L	T	T	T	FS	Strm	Eism	.....	D	Full	3	UM	W	Shel	135	GC	34x3½	34x5	Ross	.....	68
Schwartz	3500	2175	Cont	4	3¾x5	22.5	3	1/8	L	T	T	Fed	FS	Strm	Bosch	.....	L	B-Li	3	Hart	I	Torb	140	.....	34x3½	34x5	Ross	Pier	.....
Selden 1½A	3400	2185	Cont	4	3¾x5	22.5	3	1/8	L	T	T	Bus	FS	Strm	Bosch	.....	L	B-Li	3	Spic	W	Timk	140	Per	34x3½	34x5	Lav	Pier	70
Service 31	4500	2500	Buda	4	4x5½	25.6	3	1/4	L	C	C	T	Fo	Strm	Eism	.....	D	Selec	4	Spic	W	Timk	150	.....	36x3½	36x6	Ross	Simp	65
Service 36	4500	2930	Buda	4	4¼x5½	28.9	3	1/4	L	C	C	T	Fo	Strm	Eism	.....	D	Selec	4	Spic	W	Timk	150	.....	36x6	38x7	Ross	.....	65
Signal H	4675	2700	Cont	4	4 1/8x5¼	27.2	3	1/8	L	C	T	McC	FS	Strm	Eism	.....	L	B-Li	4	Spic	W	Timk	144	Per	34x4	36x6	Lav	Pier	80
Stewart 9	3440	1975	Cont	4	3¾x5	22.5	3	1/8	L	R	T	T	FS	Zen	Eism	.....	F	Full	3	Hart	I	IG	140	Det	34x3½	34x4†	Gem	.....	70
Sullivan F	3500	2350	Buda	4	3¾x4½	22.5	3	1/8	L	T	T	V	Fo	Strm	Bosch	.....	H	Covt	3	Hart	W	Timk	129	Mer	36x3½	36x5	Ross	.....	60
Texan TK	3200	1500	Lyco	4	3½x5	19.6	3	1/8	L	T	T	H	FS	Cart	Delc	.....	B	GLee	3	UP	W	1½-Fl	130	.....	34x4	34x4	CAS	.....	60
Tiffin GW	3750	2125	Cont	4	3¾x5¼	22.5	3	1/8	L	T	C	V	FS	Rayf	Bosch	.....	H	Covt	3	Hart	W	Timk	129	Mer	36x3½	36x5	Ross	Dup	.....
Transport 30	3450	1950	Cont	4	3¾x5	22.5	3	1/8	L	T	C	C	FS	Strm	Eism	.....	F	Full	3	Arv	I	Cl	140	Det	36x3½	36x5	Jac	Simp	70
Triangle A	3750	2185	Wau	4	3¾x5¼	22.5	3	....	L	C	C	Per	Sp	Strm	Eism	.....	F	Full	3	UP	I	Cl	144	Det	34x3½	34x6	Gem	Wau	60
United AX	....	....	Buda	4	4¾x5½	22.5	4	....	L	C	C	V	Fo	.....	Eism	Opt	L	B-Li	..	Bld	W	Shel	Op	.....	36x3½	36x6	Ross	Simp	80
U. S. N.	3800	1995	Cont	4	3¾x5	22.5	3	1/8	R	C	C	V	Sp	Strm	Eism	Opt	D	B-Li	3	Opt	I	Cl	144	Shel	36x3½	36x5	Lav	Mon	80
Velie 46	3650	1925	Cont	4	3¾x5	22.5	3	1/8	L	C	T	T	FS	Strm	Bosch	.....	B	Durst	3	Arv	I	Torb	133	Math	36x3½	36x5	Gem	Mon	80
White Hickory H	3975	2400	Cont	4	3¾x5	22.5	3	1/8	L	C	T	C	FS	Strm	Eism	.....	F	Full	3	Arv	W	Timk	144	Shel	36x3½	36x5	Ross	Pier	76
Wichita L	3600	2350	Own	4	3½x5	19.6	3	1/8	L	C	T	Per	Sp	Strm	.....	.....	C	Covt	3	Own	W	Shel	144	.....	36x3½	36x5	Ross	.....	.....
Winther 39	3700	2100	Wis	4	3¾x5	22.5	3	1/4	L	P	T	T	G	Strm	Eism	Bij	F	B-Li	3	Arv	W	1½-Fl	115	Per	34x3½	34x5	Lav	.....	70
Winther 439	4100	3175	Gray	4	3½x5	....	3	1/4	H	T	C	G	Strm	Eism	.....	F	Full	3	Arv	I	Cl	132	Har	34x4	34x6	Lav	.....	70
Witt Will W DT 19	3 550	2000	Cont	4	3¾x5¼	22.5	3	1/8	L	T	G	C	FS	Zen	Eism	.....	D	Selec	3	Spic	W	Timk	120	S-El	36x3	36x4	Ross	Pier	67
Wolverine C	3400	2250	Cont	4	3¾x5	22.5	....	....	L	T	L		FS	Strm	Opt	G&D	F	Selec	3	UP	I	Russ	140	Tut	34x3½	34x5	Gem	Mon	77
2 Ton																												
Acason H	4354	....	Wau	4	4¼x5¾	28.9	3	1/4	L	GD	Can	Sp	Sheb	Eism	.....	B	Cott	4	Bld	W	Timk	150	Det	36x4	36x7	Ross	Wau	76
Ace	4000	....	Buda	4	4¼ x5½	29.8	3	....	L	C	Spir	Fo	Sheb	At-K	West	L	B-Li	4	Spic	W	Timk	144	Math	36x4	36x7	Ross	Pier	.....
Acme A	4450	2750	Cont	4	4 1/8x5¼	27.2	3	1/8	L	C	GO	FS	Rayf	Eism	.....	B	Cott	3	Bld	W	Timk	148	Det	36x4	36x7	Ross	Dup	80
Armleder HW	4550	....	Cont	4	4 1/8x5¼	27.2	3	1/8	L	C	T	T	Fo	Zen	Bosch	.....	D	B-Li	3	Opt	W	Timk	Op	Math	36x4	36x7	Ross	Mon	80
Atterbury 7C LWB	5325	3075	Cont	4	4 1/8x5¼	27.2	3	1/4	L	C	T	T	Sp	Zen	Eism	.....	L	B-Li	4	Spic	W	Timk	171	SP	36x4	36x4†	Gem	Mon	92.5
Atterbury 7C STD	5260	2975	Cont	4	4 1/8x5¼	27.2	3	1/4	L	C	T	T	Sp	Zen	Eism	.....	L	B-Li	4	Spic	W	Timk	153	SP	36x4	36x4†	Gem	Mon	92.5
Autocar F	3430	2300	Own	2	4¾x4½	18	4	1/8	L	C	C	V	Sp	Strm	Mag	.....	D	Prog	3	.....	DR	Flot	97	.....	34x4	34x5	Own	.....	.....
Autocar G	3690	2400	Own	2	4¾x4½	18	4	1/8	L	C	C	V	Sp	Strm	Mag	.....	D	Prog	3	.....	DR	Flot	120	.....	34x4	34x5	Own	.....	.....
Available H-2	4500	....	Cont	4	4 1/8x5¼	27.2	3	1/8	L	C	P	T	Sp	Strm	Bosch	.....	B	B-Li	4	Spic	W	Timk	148	Tut	36x4	36x7	Lav	Pier	.....
Beck-Hawkeye C	4000	2350	Cont	4	4 1/8x5¼	....	....	....	....	C	H	Fo	Strm	Bosch	.....	F	Full	3	Bld	W	Timk	Op	Mer	36x4	36x7	Gem	Mon	80
Brockway K-3	4700	2950	Cont	4	4 1/8x5¼	27.2	3	1/8	L	P	C	C	Bus	FS	Sheb	Eism	H	B-Li	3	Spic	W	Timk	163	Stan	36x4	36x4†	Ross	Own	73
Clydesdale 65	4850	....	Cont	4	4 1/8x5¼	27.2	3	1/8	L	T	T	T	Sp	Zen	Bosch	.....	L	B-Li	4	Spic	W	Timk	144	Per	36x4	36x6	Own	Pier	80
Columbia E	4100	2350	Cont	4	4 1/8x5¼	27.2	3	1/8	L	L	T	T	FS	Shk	Dix	.....	C	Covt	3	Spic	I	Russ	144	Per	36x4	36x6	Own	Pier	80
Conestoga 30	4000	2550	Cont	4	3¾x5	22.5	3	1/8	L	L	EM	Sp	Strm	Simms	.....	F	Full	3	.....	W	Wis	138	S-El	36x4	36x4†	Ross	.....	80
Corbitt C	4850	3000	Cont	4	4 1/8x5¼	27.2	3	1/8	L	L	T	C	Sp	Strm	Eism	G&D	L	B-Li	3	.....	W	Shel	148	Shel	36x4	36x4†	Ross	.....	.....
Dart CC4	4785	2950	Buda	4	4¼x5½	28.9	3	1/4	L	L	C	T	Fo	Zen	Eism	.....	F	Full	4	Spic	W	Timk	150	Per	36x4	36x7	Ross	Simp	80
Day-Elder D	3650	2450	Cont	4	4 1/8x5¼	27.2	3	1/8	L	L	P	T	Bus	FS	Zen	Berl	D	Covt	3	Hart	W	Wis	144	Shel	36x4	36x6	Ross	Mon	72
Dearborn B	3000	1750	Buda	4	3½x5⅛	28.9	3	....	L	T	H	Sp	Strm	Bosch	.....	B	G-Lee	3	Arv	W	Chic	C-C	133	C-C	32x4*	34x5	Dit	.....	90
Defiance C	3500	1995	Cont	4	3¾x5	22.5	3	1/8	L	R	L	R	Per	FS	Strm	Eism	B	G-Lee	3	Arv	I	Torb	135	Det	34x3½	34x6	Dit	Mon	85
DeKalb E2	4150	2100	Cont	4	4 1/8x5¼	27.2	3	1/8	L	R	L	R	Per	Fo	Mas	Eism	F	K-B	W	Timk	146	Math	34x3½	36x5	Ross	Gem	68
Denby 134	3800	2450	Cont	4	3¾x5	22.5	3	1/8	L	P	T	T	L	Sp	Strm	Eism	F	Full	3	UP	I	Russ	144	Det	36x3½	36x6	Gem	Mon	75½
Diamond T-J3	4175	2925	.....	4	4 1/8x5¼	27.2	3	1/8	L	C	T	C	FS	Strm	Bosch	.....	L	B-Li	4	Spic	W	Timk	154	Math	36x4	36x7	Gem	Pier	.....

2 Ton—Continued

G. C. M. Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr. Cent of Weight on Rear Wheels
Dorris K4	5200	2985	Own	4	4¼x5½	28.9	3	¼	I	C	T	Fo	Strm	Bosch	West	D	Warn	4	Spic	W	Timk	162	Row	36x4	36x7	Ross	Own	70
Fageol	4600	3300	Wau	4	4½x5¾	28.9	3	¼	L	C	Flex	Sp	Zen	Dix	.....	B	Selec	4	Spic	W	Timk	144	Math	34x4	36x7	Ross	Wau	80
Fargo P	3900	2200	Cont	4	3¾x5	22.5	3	5/16	L	C	Own	Sp	Rayf	Bosch	.....	D	Full	3	Spic	I	Russ	144	Shel	36x4	36x6	Jac	.....	80
Federal U	4800	2600	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	Sp	Zen	Eism	.....	B	Own	4	Spic	W	Timk	156	Math	36x4	36x7	Gem	Mon	77
Forschler B	4425	2750	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	Own	FS	Zen	Bosch	Opt	F	Full	3	Hart	W	Shel	137	Own	34x4	34x7	Ross	Dup	.....
Gabriel E	5000	3250	Buda	4	4¼x5½	28.9	3	¼	L	C	T	Fo	Rayf	Bosch	L-N	B	B-Li	4	Spic	W	Timk	156	Mer	35x5	36x7	Gem	Dup	65
Garford 70B	4350	2990	Buda	4	4¼x5½	28.9	3	¼	L	C	T	Sp	Rayf	Spld	.....	L	Selec	4	Spic	W	Timk	144	Per	36x4	36x7	Ross	Simp	.....
Gary	4500	2550	Buda	4	4¼x5½	28.9	3	¼	L	C	T	Fo	Strm	Eism	.....	D	Full	3	.....	.....	Timk	144	S-El	36x4	36x6	Ross	.....	.....
Giant 16	4500	2850	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	C	FS	Sheb	Eism	.....	W	Warn	3	Spic	W	Timk	144	Math	36x4	36x7	Jac	.....	90
G. M. C. 41A	4525	2725	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	McC	FS	Mar	Eism	.....	D	Selec	4	UM	W	Timk	144	Det	36x4	36x4†	Lay	Mon	74
G. M. C. 41B	4580	2725	Cont	4	4⅛x5½	27.2	3	5/16	L	C	McC	FS	Mar	Eism	.....	D	Selec	4	UM	W	Timk	158	Det	36x4	36x4†	Lav	Mon	74
Gramm-Bernstein 20	5000	2700	Cont	4	4⅛x5¼	27.2	3	5/16	R	C	T	Sp	Strm	NE	.....	D	Own	3	Arv	W	Shel	144	.....	36x4	36x7	Ross	Pier	72.2
Grant 15	3400	2150	Cont	4	3¾x5	22.5	3	¼	L	T	Fed	FS	Cart	Spld	Remy	B	GLee	3	Arv	I	Torb	124	Per	34x4	34x6	Jac	Pier	65
Grant 16	3500	2250	Cont	4	3¾x5	22.5	3	¼	L	T	Fed	FS	Cart	Spld	Remy	B	GLee	3	Arv	I	Torb	140	Per	34x4	34x6	Jac	Pier	65
Hahn H	4800	....	Cont	4	4⅛x5¼	30	3	5/16	L	P	Own	Fo	Strm	Mag	.....	D	B-Li	3	Spic	I	Torb	136	Del	34x3½	34x6	Ross	Pier	.....
Hahn E	5000	....	Cont	4	4½x5½	40	4	¼	L	P	Own	Fo	Strm	Bosch	.....	D	B-Li	3	Spic	W	Timk	Op	Del	36x4	36x7	Ross	Pier	.....
Hall	4560	2675	Cont	4	4⅛x5¼	27.2	.....	.....	L	P	H	FS	Zen	Bosch	.....	L	B-Li	...	K-B	W	Timk	Op	Det	36x4	36x4†	Gem	Dup	.....
Harvey	3850	2850	Buda	4	4⅛x5½	27.2	3	5/16	...	...	.....	Fo	Zen	.....	.....	D	Full	...	.....	W	Shel	128	Shel	36x6*	40x8*	Ross	.....	.....
Hawkeye M	4000	2650	Buda	4	4¼x5½	28.9	3	5/16	L	C	C	FS	Zen	Eism	.....	F	Full	4	Hart	I	Cl	148	Det	36x4	36x6	Gem	Simp	70
Hendrickson I	....	3000	Buda	4	4½x5¾	28.9	3	¼	L	C	T	Fo	Strm	Dix	.....	D	Full	4	Ther	W	Timk	Op	Tut	36x4	36x7	Ross	Pier	80
Hewitt-Ludlow	4200	2950	Buda	4	4⅛x5½	27.2	.....	.....	...	...	.....	.....	Strm	Bosch	.....	B	Cott	...	Spic	...	Wis	140	.....	36x4	36x6	Ross	.....	.....
Hurlburt	5600	3750	Buda	4	4¼x5½	28.9	3	5/16	L	C	T	FS	Flch	Eism	.....	D	B-Li	3	Spic	W	Flot	148	Per	36x4	36x4†	Ross	Dup	.....
Independent G	3800	2300	Cont	4	4⅛x5¼	27.2	3	.....	L	C	C	FS	Zen	Eism	.....	F	Full	3	.....	W	Wis	144	S-El	34x3½	34x6	Wohl	.....	70
Indiana D	5000	2800	Rut	4	4⅛x5¼	27.2	3	¼	L	C	T	Fo	Strm	Eism	.....	B	Selec	4	Acme	W	½-Fl	150	S-El	36x4	36x7	Wobl	Pier	71½
International G	4010	2600	Own	4	4 x5	25.6	4	¼	O	T	T	FS	Ens	Dix	Own	D	Own	3	Own	I	Own	138	.....	36x4	36x6	Ross	Own	50
Jumbo C	4700	2600	Buda	4	4¼x5½	28.9	3	¼	L	C	GO	Fo	Zen	Eism	.....	F	Full	3	Arv	I	Cl	108	Det	36x4	36x7	Jac	Dup	60
Jumbo D	4450	2500	Buda	4	4¼x5½	28.9	3	¼	L	C	GO	Fo	Zen	Eism	.....	F	Full	3	Arv	I	Cl	152	Det	36x4	36x7	Jac	Dup	60
Jumbo E	4900	2575	Buda	4	4¼x5½	28 9	3	¼	L	C	GO	Fo	Zen	Eism	.....	F	Full	3	Arv	I	Cl	168	Det	36x4	36x7	Jac	Dup	60
King-Zeitler	4600	2950	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	FS	Strm	Bosch	.....	L	B-Li	4	Ther	W	Timk	150	Tut	36x4	36x7	Lav	.....	80
Kissel-Freighter	4700	2975	Own	4	4¼x5½	28.9	3	5/16	L	P	McC	Sp	Strm	Eism	.....	W	Warn	4	Spic	W	Timk	168	Math	36x4	36x7	Lav	Pier	80
Kalamazoo H	5230	3050	Cont	6	3½x5¼	29.4	3	¼	L	P	Hvn	FS	Strm	Conn	Dyn	B	Full	4	Acme	W	Wis	160	Kal	34x5	36x7	Ross	Pier	.....
Lange B	5200	2900	Cont	4	4⅛x5¼	27.2	3	.....	L	T	H	Sp	Strm	Bosch	.....	D	Cott	3	Hvn	C	Own	136	.....	36x4	36x6	Gem	Pier	90
Luverne BBL	....	1650	GBS	4	3¾x4¼	....	3	5/16	L	T	C	Sp	Sheb	Bosch	Dyn	D	Det	3	UP	I	Flot	136	Har	34x4*	34x5	Lav	.....	.....
Mack AB	4900	3000	Own	4	4 x5	25.6	3	.....	L	C	H	FS	Strm	Dix	.....	D	Selec	4	.....	W	Dead	Op	.....	36x6	34x4†	.....	Own	47
Manly 40	....	2350	Wau	4	3¾x5¼	22.5	3	¼	L	T	T	Sp	Zen	Eism	.....	D	Selec	3	Ther	W	½-Fl	144	Shel	36x4	36x7	Lav	Wau	.....
Master M	4300	2490	Buda	4	4¼x5½	28.9	3	¼	L	C	T	FS	Mas	Eism	I	D	B-Li	4	Arv	I	Torb	144	Det	34x4	36x7	Ross	McC	24
Master O	4400	2590	Buda	4	4¼x5½	28.9	3	¼	L	C	T	FS	Mas	Eism	I	D	B-Li	4	Arv	I	Torb	170	Det	34x4	36x7	Ross	McC	24
Master W	4500	2790	Buda	4	4¼x5½	28.9	3	¼	L	C	T	FS	Mas	Eism	I	D	B-Li	4	Arv	W	Timk	144	Det	34x4	36x7	Ross	McC	76
Master WL	4600	2890	Buda	4	4¼x5½	28.9	3	¼	L	C	T	FS	Mas	Eism	I	D	B-Li	4	Arv	W	Timk	170	Det	34x4	36x7	Ross	McC	76
Menominee D	....	2950	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	FS	Strm	Eism	.....	F	Full	3	Spic	W	Timk	144	Tut	36x4	36x4†	Ross	Mon	80
Muskegon 20	4015	2325	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	May	FS	Stew	Eism	.....	F	Full	3	Hart	I	Torb	144	Per	36x4	36x6	Lav	Pier	75
Nash 3018	3850	2175	Own	4	3¾x5¼	22.5	4	¼	L	C	T	Fo	Strm	Eism	.....	B	Selec	3	Own	I	Celf	144	Stan	34x4	34x6	Jac	Simp	73.5
Nash Quad 4017	6250	3250	Buda	4	4¼x5½	28.9	3	¼	L	C	T	Fo	Strm	Eism	.....	B	I-Cl	4	Spic	F	Own	124	Math	36x5	36x5	Lav	Simp	55
Nelson & Le Moon F2	4100	2775	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	Sp	Strm	Bosch	W	L	B-Li	3	Own	W	Timk	Op	Tut	36x4	36x7	Lav	Mon	80
Netco D	5900	3000	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	RT	Sp	Zen	Eism	.....	L	B-Li	3	Hart	W	Timk	144	Per	36x4	36x7	Ross	.....	75
Northwestern W2	4900	2950	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	MR	Sp	Strm	Bosch	.....	H	Selec	3	Bld	W	Shel	164	Shel	34x4	36x7	Ross	.....	80
Ogden B1	4300	2695	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	FS	Rayf	Bosch	.....	B	Selec	4	Acme	W	Timk	160	Tut	36x4	36x7	Gem	Pier	70
O. K. 2T	4000	2650	Buda	4	4⅛x5½	27.2	3	5/16	L	C	T	FS	Zen	Eism	.....	D	Selec	3	Hart	W	Wis	150	Tut	36x4	36x7	Ross	Pier	85
Oneida C	5440	3000	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	L	FS	Strm	Bosch	Opt	M	Cott	3	Spic	W	Timk	144	Math	36x4	36x7	Ross	Pier	82½
Oskhosh 4	4200	3500	H-Sp	4	3¼x5	16.9	3	5/16	L	C	T	FS	Zen	Bat	.....	L	B-Li	4	Peters	B	Flot	130	Tut	36x6*	36x6*	Ross	Opt	60
Packard 2-E	5100	3600	Own	4	4 x5½	25.6	3	¼	L	C	T	Fo	Own	Dix	Bij	D	Selec	4	Spic	W	Flot	144	.....	34x4	34x4†	Own	Own	48
Paige 50-18	5200	2950	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	FS	Strm	Bosch	.....	D	Selec	4	Spic	W	Timk	150	Per	36x4	36x7	Jac	Pier	80
Parker F9C	4500	3325	Cont	6	3½x5¼	29.4	3	¼	L	C	Own	Fo	Strm	Bosch	West	L	Full	4	Arv	W	Own	150	S-El	34x4	36x3½†	Ross	Mon	75
Parker F9W	4500	3325	Wis	4	4 x6	25.6	3	¼	L	C	Own	Fo	Strm	Bosch	West	L	Full	...	.....	...	Own	170	S-El	34x4	36x4†	Ross	Mon	.....
Pierce-Arrow X4	6250	4300	Own	4	4 x5½	25.6	4	¼	T	P	T	Fo	Own	Eism	.....	C	Selec	4	Own	W	Flot	144	S-El	36x4	36x4†	Own	Own	70
Rainier R-8	3600	2400	Cont	4	3¾x5	....	3	5/16	L	T	Har	FS	Zen	Sim	.....	L	B-Li	3	Hart	I	Shel	147	Det	34x4	34x6	Ross	Mon	80
Republic 19	4450	4150	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	C	FS	Strm	Eism	.....	D	Full	4	Arv	I	Torb	144	S-El	36x4	36x7	Jac	Pharo	.....
Rowe CDW	4500	3000	Wis	4	4 x5	32	4	¼	L	C	May	Fo	Zen	Bosch	.....	L	B-Li	4	Arv	W	Timk	142	Shel	34x4	36x4†	Ross	Simp	53
Royal	....	3200	Wis	4	4 x6	25.6	.....	.....	...	...	T	....	Strm	Bosch	Opt	B	Own	...	Own	W	Timk	...	Mer	36x4½	36x6	Ross	Mon	.....
Sandow I	3800	2375	Cont	4	3¾x5	22.5	3	5/16	L	P	T	FS	Strm	Eism	.....	D	Full	3	K-B	W	Torb	150	GC	36x4	36x6	Ross	Mon	24
Schacht	5500	3150	Buda	4	4¼x5½	28.9	3	¼	R	P	Own	Fo	Sheb	Bosch	.....	H	Own	3	Hart	W	Own	144	Nat	36x3½	36x7	Own	Dup	70
Schwartz	4000	2675	Cont	4	4⅛x5¼	27.2	3	5/16	L	P	Fed	FS	Strm	Bosch	.....	L	B-Li	3	Hart	I	Torb	146	.....	36x4	36x7	Ross	Pier	.....
Selden JWBL	5050	3050	Cont	4	4⅛x5¼	27.2	3	5/16	L	P	Bus	FS	Strm	Bosch	.....	L	B-Li	4	Spic	W	Timk	162	Per	36x4	36x7	Jac	Pier	70
Service 51	5180	3000	Buda	4	4¼x5½	28.9	3	¼	L	C	T	Fo	Strm	Eism	.....	D	Selec	4	Spic	W	Timk	160	.....	36x4	36x7	Ross	Simp	70
Shaw M-3	....	2750	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	FS	Zen	Bosch	.....	D	B-Li	3	Spic	W	Timk	153	Per	36x4	36x6	Gem	.....	75
Signal J	5010	3100	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	McC	FS	Strm	Eism	.....	L	B-Li	4	Spic	W	Timk	150	Per	34x4	36x8	Lav	Pier	80
Standard 76	4430	2800	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	FS	Schlr	Eism	.....	D	B-Li	4	Spic	W	Timk	140	.....	36x4	36x6	Ross	.....	70
Stewart 7	4460	2575	Cont	4	4⅛x5¼	27.2	3	5/16	R	P	T	FS	Zen	Eism	.....	F	Full	3	Hart	I	IG	156	Det	34x4	34x4†	Ross	Pier	72
Sullivan E	4500	2850	Buda	4	4⅛x5½	27.2	3	¼	L	P	V	Fo	Strm	Bosch	.....	L	B-Li	3	Bld	W	Timk	150	Shel	36x4	36x6	Ross	.....	71
Sullivan EL	4500	2950	Buda	4	4⅛x5½	27.2	3	¼	L	P	V	Fo	Strm	Bosch	.....	L	B-Li	4	Spic	W	Timk	168	US	36x4	36x6	Ross	.....	71
Superior E	3600	2275	Cont	4	4⅛x5¼	27.2	3	5/16	L	P	Idl	Fo	Strm	Eism	.....	F	Full	3	Bld	I	Torb	144	Tut	36x4	36x6	Ross	Pier	.....
Tower F	4700	2975	Cont	4	4⅛x5¼	27.2	3	5/16	L	P	T	Sp	Strm	Bosch	.....	F	Full	3	Spic	W	Timk	146	Det	36x4	36x7	Ross	Pier	70
Traffic	3300	1395	Cont	4	3¾x5	22.5	3	5/16	R	T	C	Sp	Cart	Bosch	.....	Cov	Covt	3	UM	W	Russ	133	Det	34x3½	34x5	Dit	.....	75
Transport 50	4285	2585	Cont	4	4⅛x5¼	27.2	3	5/16	L	P	C	FS	Strm	Eism	.....	F	Full	4	Arv	I	Cl	150	Det	36x4	36x6	Jac	Dup	70
Velie 25-B	5100	2950	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	FS	Strm	Bosch	.....	L	B-Li	4	Spic	W	Timk	152	Math	36x4	36x7	Gem	Pier	80
Vim 22	4500	3150	Her	4	3¾x5 1/8	22.5	4	5/16	L	C	McC	C	Zen	Dix	.....	D	Selec	4	Spic	W	Shel	142	Shel	34x4	36x4	Gem	Dup	....
Ward La France 2A	5260	3350	.....	4	4⅛x5¼	27.2	3	5/16	L	G	Own	Sp	Zen	Mag	.....	B	B-Li	4	Spic	W	Timk	154	.....	36x4	36x7	Ross	Simp	85
White TBC	4150	3300	Own	4	3¾x5 1/8	22.5	3	...	L	C	C	FS	Own	Mag	.....	D	Selec	4	Own	DR	Own	145	.....	36x4	36x4†	Own	.....	.....
Wichita M	4700	2750	Wau	4	3¾x5¼	22.5	3	¼	L	P	Per	C	Strm	Bosch	.....	C	Covt	3	Own	W	Shel	144	.....	36x4	36x6	Ross	Wau	.....
Wilson E	4500	2800	Cont	4	4⅛x5¼	27.2	3	5/16	L	C	T	FS	Mar	Eism	.....	C	Covt	3	K-B	W	Timk	144	Tut	36x4	36x7	Ross	Pier	80
Winther 49	5300	3000	Wis	4	4 x6	25.6	3	¼	L	P	T	G	Mas	Eism	Bij	F	Full	3	Bld	I	Cl	150	Math	36x4	36x4†	Ross	Dup	80
Witt Will WD2-19	4550	2850	Cont	4	4⅛x5¼	27.2	3	5/16	L	G	C	FS	Zen	Eism	.....	D	Selec	3	Spic	W	Timk	144	S-El	36x3½	36x7	Ross	Pier	67

G. C. M. Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr. Cent of Weight on Rear Wheels
2½ Ton														**2½ Ton**														
Ace	5300	....	Buda	4	4¼x5½	28.9	3	3/16	L	C	Spir	Fo	Sheb	At-K	West	L	B-Li	4	Spic	I	Timk	156	Math	36x4	36x7	Ross	Pier	.....
Beck-Hawkeye	5000	2850	Cont	4	4⅛x5¼	27.2	3	1/16	....	P	H	Fo	Strm	Bosch	.....	F	Full	3	Bld	I	½-Fl	160	Hig	36x4	36x7	Lav	Pier	70
Bessemer J-2	4500	2785	Cont	4	4⅛x5¼	27.2	3	1/16	L	C	FS	Rayf	Bosch	.....	B	B-Li	4	Arv	I	Torb	158	Per	36x4	36x4†	Ross	Pier	67
Bethlehem E	3950	2365	Own	4	4 x4½	25.6	3	1/16	L	T	Fed	FS	Sheb	Will	G&D	B	Det	3	UP	I	Russ	144	Shel	34x4	34x6	Lav	Mon	85
Brinton F	4500	3000	Cont	4	4⅛x5¼	27.2	3	1/16	L	T	T	Fo	Strm	Bosch	.....	D	Selec	3	Spic	W	Flot	150	.....	36x4	36x6	Ross	Pier	.....
Concord B	4600	3000	Buda	4	4¼x5½	28.9	3	¼	L	C	T	Sp	Zen	Eism	.....	L	B-Li	3	Spic	W	Timk	150	Per	36x4	36x4†	Ross	Mon	70
Corbitt B	5000	3200	Cont	4	4⅛x5¼	27.2	3	1/16	L	C	T	FS	Strm	Eism	G&D	L	B-Li	4	.....	W	Shel	148	Shel	36x4	36x7	Ross	Pier	75
Day-Elder C	4600	2750	Buda	4	4¼x5½	28.9	3	¼	L	P	Bus	FS	Zen	Berl	.....	D	Covt	3	Hart	W	Wis	150	Shel	36x4	36x7	Ross	Mon	72
DeKalb E 2½	4800	2600	Cont	4	4⅛x5¼	27.8	3	1/16	L	P	T	Fo	Mas	Eism	.....	F	Full	3	K-B	W	Flot	144	Math	36x5	36x6	Ross	.....	71
Doane 1919	5000	3500	Wau	4	4¼x5¾	28.9	3	¼	....	C	C	Sp	Mas	Bosch	.....	D	Selec	3	D	Ch	Dead	156	.....	36x5	36x7	Lav	Wau	79
Douglas E	4500	2675	Buda	4	4½x5½	28.9	3	.....	L	C	Own	Fo	Sheb	Eism	.....	F	Full	4	Arv	Arv	Torb	155	Own	34x4	34x6	Ross	Pier	65
Gary HU	4730	....	Buda	4	4¼x5½	28.9	3	¼	L	P	T	C	Strm	Eism	.....	F	Full	4	Hart	W	Shel	162	Tut	36x4	36x7	Ross	Simp	.....
Gersix G	5200	3150	Buda	6	3½x5¼	29.3	3	1/16	L	C	I	Sp	Strm	Bosch	West	B	Cott	3	Bld	W	Own	150	Tut	36x4	36x7	Ross	Mon	75
Gersix K	5200	3150	Buda	4	4¼x5½	28.9	3	¼	L	C	I	Fo	Strm	Bosch	.....	B	Cott	3	Bld	W	Own	150	Tut	36x4	36x7	Ross	Mon	75
Gramm-Bernstein	5210	3350	Wau	4	4¼x5¾	28.9	3	¼	L	C	T	Sp	Zen	Eism	.....	D	Own	3	Arv	W	Shel	156	.....	36x4	36x4†	Ross	Wau	70
Harvey WFA	5300	3000	Buda	4	4¼x5½	28.9	4	¼	L	L	T	.....	FS	Strm	Eism	.....	B	B-Li	4	Spic	W	Shel	150	Shel	36x4	36x7	Ross	Dup	60
Hewitt-Ludlow	4800	3300	Buda	4	4¼x5½	28.9	4	¼	.....	.....	.....	Fo	Strm	.....	.....	B	Cott	4	Spic	.....	Wis	150	.....	36x4	36x7	Ross	.....	.....
Kalamazoo	6970	3900	Cont	6	3¾x5¼	33.8	3	¼	L	D	Hvn	FS	Strm	Conn	Dyn	B	Full	4	Acme	W	Shel	160	Own	35x5	36x5†	Ross	Pier	.....
Kankakee E	3500	2475	Cont	6	3½x5¼	29.4	3	¼	L	C	H	FS	Zen	Will	Delc	D	Munc	3	Acme	.....	Russ	170	Tem	34x4	34x6	Ross	.....	70
Kelly-Springfield K35	5200	3250	Own	4	3¾x5¼	22.5	3	¼	L	C	Fed	Fo	Zen	Eism	West	C	Covt	3	Own	C	Dead	144	Per	36x4	36x4†	Gem	Own	89
Kelly-Springfield K36	5540	3250	Own	4	3¾x5¼	22.5	3	¼	L	C	Fed	Fo	Zen	Eism	West	C	Covt	3	Spic	W	½-Fl	144	Per	36x4	36x4†	Gem	Own	89
Kimball B	....	....	Wis	4	4¼x6	28.9	3	¼	L	C	Flex	FS	Zen	Eism	.....	L	Selec	4	Spic	W	Timk	Op	US	36x4	36x7	Lav	Dup	80
Koehler M	4200	2965	Own	4	4 x5⅛	25.6	3	¼	L	C	T	P	Zen	Eism	.....	D	B-Li	4	Spic	W	Timk	162	.....	36x4	36x7	Lav	Simp	75
Larrabee-Deyo C-D	5200	3000	Cont	4	4⅛x5¼	27.2	3	1/16	L	C	Bus	Sp	Strm	Bosch	.....	L	B-Li	4	M	W	Shel	154	Mer	36x4	36x7	Ross	Pier	.....
Maccar H	5110	3300	Cont	4	4½x5½	32.4	3	1/16	L	C	Own	FS	Strm	Bosch	.....	L	B-Li	3	Spic	W	Timk	162	Mer	36x4	36x4†	Ross	Pier	70
Manly 50	....	2800	Wau	4	4 x5¾	25.6	3	¼	L	C	T	Sp	Zen	Eism	.....	C	Selec	4	Ther	W	½-Fl	156	Shel	36x4	40x8	Lav	Wau	.....
Moreland 19 C	5380	3775	Cont	4	4½x5½	32.4	3	1/16	L	C	C	Fo	Mill	Dix	.....	D	Selec	4	Ther	W	Timk	Op	US	36x4	36x7	Ross	.....	.....
Netco H	6500	3400	Cont	4	4½x5½	32.4	3	1/16	L	C	RT	Sp	Zen	Eism	.....	L	B-Li	4	Hart	W	Timk	170	Per	36x4	36x8	Ross	.....	75
Noble NW2	5050	3100	Cont	4	4⅛x5¼	27.2	3	1/16	L	C	T	FS	Strm	Eism	.....	B	Full	4	Bld	W	Shel	148	Kal	36x4	36x7	Ross	Pier	80
Old Reliable	5750	3250	Wis	4	4¼x6	28.9	3	¼	L	C	H	FS	Strm	Bosch	.....	D	B-Li	3	Spic	W	Shel	160	Shel	34x4	36x4†	Ross	Mon	.....
Panhard E	4500	2350	Buda	4	4¼x5½	33.6	3	1/16	L	C	CAS	P	Strm	Eism	Opt	D	Full	3	UP	I	Torb	150	Det	36x4	36x6	Lav	Dup	.....
Patriot Washington	4600	3150	Cont	4	4⅛x5¼	27.2	3	1/16	L	C	Own	FS	Strm	Bosch	.....	D	Selec	4	Ther	H	W	156	S-El	34x4	34x7	W	Pier	80
Pittsburgher D	5200	....	Cont	4	4⅛x5¼	27.2	3	¼	....	....	T	Fo	Strm	Bosch	.....	L	B-Li	....	Spic	.....	Shel	160	S-El	36x5	36x7	Ross	Mon	.....
Reliance	5000	3200	Buda	4	4¼x5½	28.9	3	¼	L	C	T	Fo	Strm	Bosch	.....	F	Full	3	Hart	E	Dead	156	Shel	36x4	36x4†	Ross	Pier	67
Rock Falls	2800	....	Buda	6	3½x5¼	29.4	3	1/16	L	P	H	FS	Rayf	Bosch	W	B	GLee	3	Spic	SG	Flot	150	Tut	35x5*	35x5*	Gem	.....	50
Rowe CDW	4600	3250	Wis	4	4 x5	25.6	4	¼	L	P	C	May	Fo	Zen	Bosch	.....	L	B-Li	4	Arv	W	Timk	164	Shel	34x4	36x4†	Ross	Simp	61
Royal	....	3500	Wis	4	4¼x6	29.8	....	....	....	....	T	....	Strm	Bosch	Opt	B	Own	...	Own	W	Timk	132	Mer	36x4½	36x6	Ross	Mon	.....
Sandow J	4500	2975	Cont	4	4⅛x5¼	27.2	3	1/16	L	P	T	FS	Strm	Bosch	.....	D	B-Li	3	K-B	W	Timk	165	GC	36x4	36x7	Ross	Mon	70
Sanford 25	5200	3000	Cont	4	4⅛x5½	27.2	3	1/16	L	P	T	Fo	Strm	Bosch	.....	B	B-Li	4	Spic	W	Shel	156	S-El	36x4	36x4†	Ross	Pier	75
Schacht	6000	3500	Buda	4	4¼x5½	28.9	3	1/16	L	P	Own	Fo	Sheb	Bosch	.....	H	Selec	3	Hart	W	Own	156	Nat	36x4	36x4†	Own	Dup	70
Schwartz	4000	2675	Cont	4	4⅛x5¼	27.2	3	1/16	L	P	Own	Fo	Sheb	Bosch	.....	H	B-Li	3	Hart	I	Torb	146	.....	36x4	36x7	Ross	Pier	.....
Sterling	5550	3300	Ster	4	4¼x5¾	28.9	3	1/16	L	R	P	C	Own	Sp	Zen	Eism	.....	.....	B-Li	3	Spic	W	Shel	156	Math	36x4	36x4†	Ross	Wau	80
Tiffin MW	4890	2850	Cont	4	4⅛x5½	27.2	3	1/16	L	C	T	FS	Rayf	Bosch	.....	D	Covt	3	Acme	W	Timk	148	Kal	36x4	36x4½†	Ross	Pier	80
Triangle B	4900	2850	Rut	4	4⅛x5½	27.2	3	....	L	C	Per	Fo	Strm	Eism	.....	F	Full	4	UP	I	Cl	151	Det	36x4	36x7	Gem	Pier	60
Union B	4800	2465	Cont	4	4⅛x5½	27.2	3	1/16	L	P	C	G&O	Fo	Sheb	Eism	.....	F	Full	4	UP	I	Russ	152	Math	36x4	36x7	Ross	Dup	70
United BX	....	....	Buda	4	4¼x5½	28.9	3	¼	L	P	T	Fo	Strm	Eism	Opt	L	B-Li	4	Bld	W	Shel	Op	.....	36x4	36x7	Ross	Simp	80
U. S. H.	5200	3250	Cont	4	4⅛x5¼	27.2	3	3/16	L	C	T	Sp	Strm	Eism	.....	H	B-Li	4	Opt	W	Shel	144	Shel	34x4	36x4†	Lav	Pier	80
Wichita R	5200	2950	Wau	4	3¾x5¼	22.5	3	1/16	L	P	Per	C	Strm	.....	.....	C	Covt	3	Own	W	Shel	144	.....	36x4	36x7	Ross	Wau	.....
Wilcox Q	4700	....	Own	4	4¼x5½	28.9	3	¼	L	P	T	Sp	Strm	Mag	.....	W	Selec	4	Own	W	½-Fl	135	Shel	36x4	36x3½†	Ross	Pier	80
3 Ton														**3 Ton**														
Denby 25	4790	3000	Cont	4	4⅛x5¼	27.2	3	1/16	R	C	L	FS	Strm	Eism	.....	F	Full	4	UP	I	Russ	150	Det	36x4	36x7	Gem	Mon	79
F. W. D-B	6300	4500	Wis	4	4¾x5½	36.1	3	¼	T	C	T	Fo	Strm	Eism	.....	D	Cott	3	Opt	B	Flot	124	Tut	36x6	36x6	Ross	Pier	55
Forschler B-X	2800	3450	Cont	4	4⅛x5¼	27.2	3	1/16	L	C	Own	FS	Zen	Bosch	Opt	F	Full	4	Hart	W	Shel	137	Own	34x4	34x8	Ross	Dup	...
Kimball K	....	....	Wis	4	4¾x5½	36.1	3	¼	T	C	Flex	Fo	Zen	Berl	.....	L	B-Li	4	Spic	W	Shel	Op	US	36x4	36x8	Ross	Dup	80
Manly 60	....	3350	Wau	4	4¼x5¾	29.8	3	¼	L	C	T	Sp	Zen	Eism	.....	D	Selec	4	Ther	W	½-Fl	156	Shel	36x5	40x10	Wohl	Wau	.....
O. K. 2-T	4250	3250	Buda	4	4¼x5½	28.9	3	1/16	L	C	T	FS	Zen	Eism	.....	D	Selec	4	Hart	W	Wis	154	Tut	36x4	36x8	Ross	Pier	85
Packard 3-E	7000	4350	Own	4	4½x5½	32.4	3	1/16	L	C	T	Fo	Own	Dix	Bij	D	Selec	4	Spic	W	Flot	186	.....	36x5	36x5	Own	Own	52.1
Rennoc M	5050	2895	Buda	4	4⅛x5½	27.2	3	1/16	L	C	T	Fo	Strm	Spld	.....	W	Warn	4	Hart	W	Wis	144	Row	36x5	36x7	Lav	Pier	65
Riker B	6900	4600	Own	4	4¼x6	28.9	5	¼	L	T	T	FS	B&B	Berl	West	C	Selec	4	Own	W	Own	150	Opt	36x5	36x5†	Ross	Own	75
Rowe GW	5500	4500	H-Sp	8	3¼x5	33.8	3	1/16	L	C	C	May	Fo	Zen	At-K	West	L	B-Li	4	M	W	Shel	170	Shel	37x7*	42x9*	Ross	.....	55
Vim 23	6000	3950	Her	4	4¼x5½	28.9	5	1/16	L	C	C	McC	C	Zen	Dix	.....	D	Selec	4	Spic	W	Shel	175	Shel	36x4	36x4†	Gem	Dup	.....
Ward-LaFrance 3A	5390	3750	.....	4	4⅛x5¼	27.2	3	1/16	L	C	Own	Sp	Zen	Mag	.....	B	B-Li	4	Spic	W	Wis	166	.....	36x4	36x5†	Ross	Simp	85
White TJ	7750	4300	Own	4	3¾x5¾	22.5	....	....	L	C	T	Fo	Own	Mag	.....	D	Selec	4	Own	DR	Own	174	.....	36x5	40x5†	Own	Own	.....
Winther 69	6400	3800	Wis	4	4 x6	25.6	3	¼	L	P	T	G	Mas	Eism	Bij	B	B-Li	4	Bld	I	Cl	150	Math	36x5	36x5†	Ross	Dup	85
3½ Ton														**3½ Ton**														
Acason L	6400	....	Wau	4	4¼x6¾	28.9	3	¼	L	P	Can	Sp	Sheb	Eism	.....	B	Cott	4	Bld	W	Timk	172	Det	36x5	36x5†	Ross	Wau	76
Acme C	6516	3750	Cont	4	4½x5½	32.4	3	1/16	L	C	GO	FS	Rayf	Eism	.....	B	Cott	3	Bld	W	Timk	168	Det	36x5	40x5†	Ross	Dup	80
Armleder KW	6600	....	Cont	4	4½x5½	32.4	3	1/16	L	C	T	Fo	Zen	Bosch	.....	D	B-Li	3	Opt	W	Timk	156	Math	36x5	36x5†	Ross	Mon	60
Atterbury 7D LWB	7000	3975	Cont	4	4½x5½	32.4	3	1/16	L	C	T	Sp	Zen	Bosch	.....	B	B-Li	4	Spic	W	Timk	192	SP	36x5	40x5†	Gem	Mon	92
Atterbury 7D Stan	6910	3875	Cont	4	4¼x5½	32.4	3	¼	L	C	T	Fo	Zen	Eism	.....	L	B-Li	4	Spic	W	Timk	167	SP	36x5	40x5†	Gem	Cont	98
Available H-3	6400	....	Cont	4	4½x5½	32.4	3	1/16	L	C	T	Sp	Strm	Bosch	.....	B	B-Li	4	Spic	W	Timk	172	Tut	36x5	40x5†	Lav	Pier	.....
Bessemer K	5900	3450	Cont	4	4½x5½	32.4	3	1/16	L	C	T	FS	Rayf	Bosch	.....	B	B-Li	4	Spic	I	Torb	175	Per	36x6	36x6†	Ross	Pier	75
Bethlehem F	4983	3465	Own	4	4½x6	30.6	4	¼	L	C	Fed	FS	Sheb	Will	G&D	B	Det	3	UP	I	Russ	162	Shel	34x4	34x5†	Lav	Mon	85
Brockway R	6800	3900	Cont	4	4½x5½	32.4	3	¼	L	P	Bus	FS	Sheb	Eism	.....	L	B-Li	4	Spic	W	Timk	Op	Mer	36x5	36x5†	Gem	Opt	75
Clydesdale 90	9600	....	Cont	4	4½x5½	32.4	3	1/16	L	C	T	Sp	Zen	Bosch	.....	L	B-Li	4	Spic	W	Timk	170	Stan	36x5	40x5†	Ross	Own	78
Corbitt A	6780	4000	Cont	4	4½x5¾	32.4	3	1/16	L	C	T	Sp	Strm	Eism	G&D	M	Cott	3	.....	W	Shel	168	Shel	36x5	36x10	Ross	Pier	80

G. C. M. Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr.Cent of Weight on Rear Wheels
3½ Ton—Continued																												
Couple Gear	9000	6000	Wis	4	5.1x5½	35	4	¼	T	G	H	Fo	Strm	Eism	.....	O	Own	5	.....	B	Own	144	Tut	36x4†	36x4†	Ross	.....	55
Dart L	6740	4000	Buda	4	4½x6	32.4	3	¼	L	C	C	Fo	Zen	Eism	.....	W	Warn	4	Spic	W	Timk	160	Per	36x5	36x10	Ross	Simp	75
Day-Elder F	5600	3350	Cont	4	4½x5½	32.4	3	5/16	L	R	C	P	Bus	FS	Zen	Berl	.....	D	Warn	4	UP	I	Cl	170	Det	36x5	36x10	Ross	Simp	78
Denby 27	6890	4150	Cont	4	4½x5½	32.4	3	5/16	L	C	L	FS	Strm	Eism	.....	D	Warn	4	Spic	W	Timk	176	Row	36x5	36x10	Ross	Own	70
Diamond T-LB	6570	4150	.....	4	4½x5½	32.4	3	¼	L	C	T	FS	Strm	Bosch	.....	L	B-Li	4	Spic	W	Timk	176	Row	36x5	36x10	Ross	Own	70
Dorris K7	6500	3800	Own	4	4¼x5½	28.9	3	¼	L	C	T	Fo	Strm	Bosch	West	D	Warn	4	Spic	W	Timk	176	Row	36x5	36x10	Ross	Own	70
Duplex E	6050	4000	Buda	4	4¼x5½	28.9	3	¼	O	C	L	FS	Sheb	Eism	.....	L	B-Li	4	Bld	I	Own	130	Tut	36x6	36x6	Lav	Dup	60
Fageol	7300	4250	Wau	4	4¾x5¾	36.1	3	¼	L	C	Flex	Sp	Zen	Dix	.....	B	Selec	5	Spic	W	Timk	156	Math	36x5	36x5†	Ross	Wau	80
Federal W	7000	3350	Cont	4	4½x5½	32.4	3	5/16	L	C	T	Sp	Zen	Eism	.....	B	Own	4	Spic	W	Timk	156	Math	36x5	36x5†	Gem	Mon	79
Garford 77C	7235	4300	Wis	4	4¾x5½	36.1	3	¼	L	C	T	Fo	Rayf	Eism	.....	L	Selec	4	Spic	W	Timk	128	Per	36x5	40x5†	Ross	Simp	.....
Gary	7000	3750	Buda	4	4½x6	32.4	3	¼	L	C	T	Fo	Strm	Eism	.....	W	B-Li	4	Bld	W	Timk	162	S-El	36x5	40x5†	Ross	Simp	.....
Giant 17	6800	3850	Cont	4	4½x5½	32.4	3	5/16	L	C	C	FS	Strm	Eism	.....	L	Warn	4	Spic	W	Timk	116	Det	36x5	36x5†	Ross	Pier	70
G. M. C. 71A	6985	3750	Cont	4	4½x5½	32.4	3	5/16	L	C	McC	FS	Mar	Eism	.....	D	Selec	4	UM	W	Timk	163	Det	36x5	40x5†	Lav	Mon	75
G. M. C. 71B	7100	3800	Cont	4	4½x5½	32.4	3	5/16	L	C	McC	FS	Mar	Eism	.....	D	Selec	4	UM	W	Timk	187	Det	36x5	40x5†	Lav	Mon	75
Gramm-Bernstein	6790	4000	Wau	4	4½x5¾	32.4	3	¼	L	C	T	Sp	Zen	Eism	.....	D	Own	4	Own	W	Shel	158	.....	36x5	40x5†	Ross	Wau	70
Hahn F	7000	....	Cont	4	4½x5½	32.4	4	¼	L	C	Own	Fo	Strm	Bosch	.....	D	B-Li	4	Spic	W	Timk	Op	Del	36x5	36x5†	Ross	Pier	.....
Hall	6100	3500	Cont	4	4½x5½	32.4	3	5/16	L	P	L	FS	Zen	Bosch	.....	L	B-Li	...	K-B	W	Timk	Op	Det	36x5	36x5†	Gem	Dup	.....
Harvey WHA	7700	3900	Buda	4	4½x6	32.4	4	¼	L	P	.....	FS	Strm	Eism	.....	B	B-Li	4	Spic	W	Shel	160	Shel	36x5	36x5†	Ross	Dup	60
Hendrickson J	....	3800	Buda	4	4½x5¾	28.9	3	¼	L	P	T	Fo	Strm	Dix	.....	D	Full	4	Ther	W	Timk	Op	Tut	36x5	36x5†	Ross	Pier	80
Hewitt-Ludlow	6300	4000	Buda	4	4½x5½	28.9	.....	.....	.....	.....	.....	.....	Strm	Bosch	.....	B	Cott	4	Spic	.....	Wis	156	.....	36x5	36x5†	Ross	.....	.....
Hurlburt	6400	4450	Buda	4	4½x6	32.4	3	¼	L	C	T	FS	Flch	Eism	.....	D	B-Li	4	Spic	W	Flot	152	.....	36x5	36x5	Ross	Dup	.....
Indiana R	6300	3450	Rut	4	4⅜x5½	30.6	3	¼	L	C	T	Fo	Strm	Eism	.....	B	Selec	4	Acme	W	½-Fl	156	S-El	36x5	36x5†	Wohl	Pier	75
Kelly-Springfield K-40	8285	4250	Own	4	4½x6½	32.4	3	¼	L	T	C	Fed	Fo	Rayf	Eism	West	C	Covt	3	Own	C	Dead	150	Per	36x5	40x5†	Gem	Own	93
Kissel-Heavy Duty	7000	3975	Own	4	4¼x5½	28.9	3	5/16	L	C	McC	Sp	Strm	Eism	.....	W	Warn	4	Spic	W	Shel	168	Shel	36x5	36x5†	Ross	Pier	80
Kalamazoo K	6970	3900	Cont	6	3¾x5¼	33.8	3	¼	L	P	Hvn	FS	Strm	Conn	Dyn	F	Full	4	Acme	W	Shel	160	Kal	36x5	36x5†	Ross	Pier	.....
Larrabee-Deyo A-B	6850	3950	Cont	4	4½x5½	32.4	3	5/16	L	C	Bus	Sp	Strm	Bosch	.....	L	B-Li	4	M	W	Shel	172	Mer	36x5	36x5†	Ross	Pier	.....
Maccar M	6550	4100	Cont	4	4½x5½	32.4	3	5/16	L	C	Own	FS	Strm	Bosch	.....	L	B-Li	3	Spic	W	Timk	174	Mer	36x5	36x5†	Ross	Pier	70
Mack AC	8070	4600	Own	4	5 x6	40	2	....	L	C	T	FS	Strm	Dix	.....	D	Selec	3	.....	C	Dead	Op	.....	36x5	40x5†	Ross	Own	46
Master A	6900	3890	Buda	4	4½x6	32.4	4	¼	L	C	T	FS	Mas	Eism	.....	D	B-Li	4	Spic	W	Timk	158	Det	36x5	40x5	Ross	Pier	28
Master AL	2000	4890	Buda	4	4½x6	32.4	4	¼	L	C	T	FS	Mas	Eism	.....	D	B-Li	4	Spic	W	Timk	194	Det	36x5	40x5	Ross	Pier	28
Menominee G	....	3880	Cont	4	4½x6½	32.4	3	¼	T	C	T	FS	Strm	Eism	.....	F	Full	4	Spic	W	Timk	160	Tut	36x5	36x6	Ross	Mon	80
Nelson & Le Moon F3½	6000	3750	Cont	4	4¾x6½	32.4	3	¼	T	C	T	Sp	Zen	Eism	.....	L	B-Li	4	Own	W	Timk	Op	Tut	36x5	36x5†	Lav	Mon	80
Old Reliable	6650	4000	Wis	4	4¾x5½	28.9	3	¼	L	C	T	FS	Strm	Bosch	.....	D	B-Li	...	Spic	W	Shel	160	Shel	34x5	36x5†	Ross	Mon	.....
Oneida D	7270	3700	Cont	4	4½x5½	32.4	3	5/16	L	C	T	FS	Rayf	Bosch	.....	D	Cott	3	Spic	W	Timk	160	Math	36x5	36x5†	Ross	Pier	82½
Paige 51-18	7000	3950	Cont	4	4½x5½	32.4	3	5/16	L	C	L	FS	Strm	Bosch	.....	D	Selec	4	Spic	W	Timk	160	Per	36x5	36x5†	Jac	Simp	80
Parker J9	6800	4150	Wis	4	4¼x6	32.4	4	....	L	C	Own	F	Strm	Bosch	West	L	B-Li	4	Warn	.....	Own	...	S-El	36x5	40x5†	Ross	Mon	.....
Republic 20	6400	3595	Cont	4	4½x5½	32.4	3	¼	L	C	T	FS	Strm	Eism	.....	D	Full	4	K-B	I	Torb	165	S-El	36x5	36x10	Jac	Pharo	.....
Rowe DEW	6520	3800	Wis	4	4¼x6	28.9	4	¼	L	C	May	Fo	Zen	Bosch	.....	L	B-Li	4	M	W	Shel	156	Shel	36x5	36x5†	Ross	Simp	54
Sandow M	6500	3995	Cont	4	4½x5½	32.4	3	5/16	L	P	T	FS	Strm	Bosch	.....	D	B-Li	4	K-B	W	Timk	175	GC	36x5	36x5†	Ross	Mon	71
Sanford 35	6600	3975	Cont	4	4½x5½	32.4	3	5/16	L	P	T	Fo	Strm	Bosch	.....	B	B-Li	4	Spic	W	Shel	174	S-El	36x5	36x5†	Ross	Pier	75
Schacht	6500	3950	Buda	4	4¼x5½	28.9	3	¼	R	P	Own	Fo	Sheb	Bosch	.....	H	Own	3	Hart	W	Own	168	Nat	36x5	36x5†	Own	Dup	70
Selden NL	6550	3850	Cont	4	4½x5½	32.4	3	5/16	L	P	Bus	FS	Strm	Eism	.....	L	B-Li	4	Spic	W	Timk	164	Per	36x5	36x10	Ross	Pier	70
Service 71	6700	3900	Buda	4	4¼x5½	28.9	3	¼	L	P	T	Fo	Strm	Eism	.....	D	Selec	4	Spic	W	Timk	171	Per	36x5	36x5†	Ross	Simp	70
Service 76	7100	4200	Buda	4	4½x6	32.4	3	¼	L	C	T	Fo	Strm	Eism	.....	D	Selec	4	Spic	W	Timk	171	.....	36x5	36x5†	Ross	Simp	70
Signal M	7070	4100	Cont	4	4½x5½	32.4	3	5/16	L	C	McC	FS	Strm	Eism	.....	B	B-Li	4	Spic	W	Timk	168	Per	36x5	40x5†	Lav	Pier	80
Standard 66	6480	3675	Cont	4	4½x5½	32.4	3	5/16	L	C	T	FS	Strm	Eism	.....	D	B-Li	4	Spic	W	Timk	160	.....	36x5	36x5†	Gem	Mon	75
Sterling	8300	4325	Ster	4	4¼x6¾	28.9	3	¼	L	C	Own	Sp	Rayf	Eism	.....	N	Own	3	Spic	W	Timk	162	Math	36x5	40x5†	Ross	Wau	90
Stewart 10	6080	3500	Cont	4	4½x5½	32.4	3	5/16	L	P	.....	FS	Zen	Eism	.....	F	Full	4	Hart	I	IG	165	Det	36x5	36x5†	Ross	Pier	80
Tiffin PW	6850	3760	Cont	4	4½x5½	32.4	3	5/16	L	P	T	Sp	Zen	Bat	.....	B	Covt	3	Acme	W	Shel	160	Kal	36x5	36x5†	Ross	Pier	80
Titan	7350	4300	Buda	4	4½x6	32.4	3	¼	L	P	T	Fo	Strm	Eism	.....	D	Cott	4	.....	I	C	162	Math	36x5	40x5†	Lav	Simp	70
Tower G	6800	4100	Cont	4	4½x5½	32.4	3	¼	L	P	T	Sp	Strm	Bosch	.....	F	Full	4	Spic	W	Timk	165	Det	36x5	36x5†	Ross	Pier	70
Twin City 4 Wheel D-B	7200	4750	Wis	4	5½x6	42	3	....	T	C	H	FS	Strm	K-W	.....	M	Cott	3	.....	I	½-Fl	140	.....	36x6	36x6	Ross	Pier	60
United CX	....	....	Buda	4	4½x6	32.4	4	¼	L	C	.....	Fo	Strm	Eism	Opt	L	B-Li	4	Bld	W	Shel	160	.....	36x5	36x5†	Ross	Simp	80
U. S. J.	7000	3950	Cont	4	4½x5½	32.4	3	5/16	L	C	T	Sp	Strm	Eism	.....	H	B-Li	4	Opt	W	Shel	162	Shel	36x5	35x5†	Lav	Pier	80
Velie 26-B	7400	3900	Cont	4	4½x5½	32.4	3	5/16	L	C	T	FS	Strm	Bosch	.....	L	B-Li	4	Spic	W	Timk	174	Math	36x5	36x5†	Gem	Pier	80
Victor M	6600	3800	Cont	4	4½x5½	32.4	3	5/16	L	C	Own	FS	Strm	Bosch	.....	L	B-Li	4	Spic	W	Timk	176	S-El	36x6	36x5†	Gem	.....	.....
Ward La France 3½-A	5800	3900	.....	4	4½x5½	32.4	3	5/16	L	C	Own	Sp	Zen	Mag	.....	B	B-Li	4	Spic	W	Wis	170	.....	36x5	40x5†	Ross	Simp	85
Wichita O	6500	3750	Wau	4	4½x5¾	32.4	3	¼	....	C	EM	C	Strm	.....	.....	C	B-Li	4	Own	W	Shel	165	.....	36x5	36x5†	Ross	Wau	.....
Wilcox P	6300	....	Own	4	4¼x5	28.9	3	¼	L	C	T	Sp	.....	Bosch	.....	C	Selec	4	Own	W	½-Fl	139	Shel	36x5	36x5†	Own	Pier	.....
Wilson G	6800	3800	Cont	4	4½x5½	32.4	3	5/16	L	C	T	FS	Mar	Eism	.....	D	Warn	4	K-B	W	Timk	160	Tut	36x5	36x5†	Ross	Pier	80
Winther 479	7700	4900	Wis	4	4¼x6	28.9	3	¼	L	P	T	G	Mas	Eism	Bij	B	Full	4	Bld	I	Cl	158	Math	36x5	36x5†	Ross	Dup	65
4 Ton																												
Gabriel F	5800	4300	Buda	4	4½x6	32.4	3	¼	L	T	T	Fo	Rayf	Bosch	L-N	B	B-Li	4	Spic	W	Timk	180	Mer	36x5	40x10	Gem	Dup	65
Kelly-Springfield K-45	8730	4400	Own	4	4½x6½	32.4	3	¼	T	C	Fed	Fo	Rayf	Eism	West	C	Covt	3	Own	C	Dead	150	Per	36x5	40x6†	Gem	Own	93
Kimball E	....	....	Wis	4	5.1x5½	38.9	3	¼	T	C	Flex	Fo	Zen	Berl	.....	L	B-Li	4	Spic	W	Shel	Op	US	36x5	40x10	Ross	Dup	80
King Zeitler	6500	4200	Cont	4	4½x5½	32.4	3	5/16	L	G	T	FS	Strm	Bosch	.....	L	B-Li	4	Ther	W	Timk	180	Mer	36x5	40x5†	Lav	Pier	80
Moreland 19G	7810	4875	Cont	4	4¾x6	36.1	3	¼	L	C	C	FS	Mill	Dix	.....	D	Selec	4	Ther	W	Timk	162	US	36x5	40x5†	Ross	Cont	.....
Noble WW4	7170	3950	Cont	4	4½x5½	32.4	3	5/16	L	C	T	FS	Strm	Eism	.....	B	Full	4	Acme	W	Shel	168	Kal	36x5	36x5†	Ross	Pier	80
Packard 4E	7460	4550	Own	4	4½x5½	32.4	3	¼	L	C	T	Fo	Own	Dix	Bij	D	Selec	4	Spic	W	Flot	186	.....	36x5	40x5	Own	Own	55
Riker	7200	4700	Own	4	4½x6	28.9	5	¼	L	T	T	FS	B&B	Berl	West	C	Selec	4	Own	W	Own	150	Opt	36x5	36x6†	Ross	Own	77
Shaw M4	....	1850	Cont	4	3¾x5	22.4	3	5/16	L	T	T	Fo	Zen	Bosch	.....	D	B-Li	3	Spic	W	Timk	130	Per	34x4½	34x4½*	Gem	.....	.....
Union C	6600	3500	Wis	4	4¼x6	28.9	3	¼	L	P	G&O	Fo	Sheb	Eism	.....	F	Full	4	UP	I	Torb	171	Math	36x6	36x10	Ross	Dup	75
Winther 88	7600	4200	Wis	4	4¼x6	28.9	3	¼	L	P	T	G	Mas	Eism	Bij	B	B-Li	4	Bld	I	Cl	156	Math	36x5	40x5†	Ross	Dup	80

G. C. M. Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr. Cent of Weight on Rear Wheels
5 Ton																												
Acason M	8350	....	Wau	4	4¾x6¾	36.1	3	¼	L	P	Can	Sp	Sheb	Eism	.....	B	Cott	3	Bld	W	Timk	187	Det	36x6	40x6†	Ross	Wau	77
Acme E	8860	4850	Cont	4	4¾x6	36.1	3	¼	L	C	GO	Fo	Rayf	Eism	.....	B	Cott	3	Bld	W	Timk	180	Det	36x6	40x6†	Ross	Cont	80
Atterbury 8 E	9635	4975	Cont	4	4¾x6	36.1	3	¼	L	C	T	Fo	Zen	Eism	.....	L	B-Li	4	Spic	W	Timk	167	SP	36x5	40x6†	Gem	Cont	98
Available 5	8100	....	Cont	4	4¾x6	36.1	3	1/16	L	C	T	Sp	Strm	Bosch	.....	B	B-Li	4	Spic	W	Timk	172	Tut	36x6	40x6†	Lav	Pier	.....
Brockway T	8800	5000	Cont	4	4¾x6	36.1	3	¼	L	C	Bus	Fo	Sheb	Eism	.....	L	B-Li	4	Spic	W	Timk	174	Mer	36x6	40x6†	Gem	Dup	.....
Clydesdale 120B	8500	....	Cont	4	4¾x6	36.1	3	¼	L	C	T	Fo	Strm	Eism	.....	L	B-Li	4	Spic	W	Timk	On	Stan	36x5	40x6†	Ross	Own	76
Corbitt AA	8900	5000	Cont	4	4¾x6	36.1	3	1/16	L	C	McC	FS	Strm	Eism	.....	D	B-Li	4	Hart	W	Shel	178	Shel	36x6	40x6†	Ross	Cont	75
Couple Gear	11000	6500	Wis	4	5¼x7	42	4	1/16	T	G	H	Fo	Strm	Eism	Own	.....	Own	75	.....	B	Own	144	Tut	36x5†	36x5†	Own	.....	60
Day-Elder E	10000	4500	Buda	4	4½x6	32.4	3	¼	L	P	Bus	Fo	Zen	Berl	.....	D	B-Li	4	Hart	W	Shel	170	Shel	36x5	40x6†	Ross	Mon	73
Denby 210	8590	4900	Cont	4	4½x5½	32.4	3	1/16	L	C	L	FS	Strm	Eism	.....	D	Warn	4	UP	I	Cl	170	Det	36x6	40x12	Ross	Simp	80
Diamond T-R	8300	4950	.....	4	4½x5½	32.4	3	1/16	L	C	T	FS	Strm	Bosch	.....	L	B-Li	4	Spic	W	Timk	170	Math	36x6	40x6†	Gem	Pier	.....
Fageol	8300	5100	Wau	4	4¾x5¾	36.1	3	¼	L	C	Flex	Sp	Zen	Dix	.....	B	Selec	5	Spic	W	Timk	156	Math	36x6	36x6†	Ross	Wau	80
Federal X	8100	4400	Cont	4	4½x5½	32.4	3	1/16	L	C	T	Sp	Zen	Eism	.....	B	Own	4	Spic	W	Timk	156	Math	36x6	40x6†	Gem	Mon	80
Garford 68	8870	5000	Wis	4	4¾x5½	36.1	3	¼	L	T	T	Fo	Rayf	Eism	.....	L	Selec	4	Spic	C	Dead	128	Per	36x6	40x6†	Ross	Simp	.....
Gary M	8500	4650	Buda	4	5 x6½	40	....	....	L	C	T	Fo	Strm	Eism	.....	L	B-Li	...	.....	.....	Timk	170	S-El	36x6	40x6	Ross	.....	.....
G. M. C. 101-A	8000	4350	Cont	4	4½x5½	32.4	3	1/16	L	C	McC	FS	Mar	Eism	.....	D	Selec	4	UM	W	Timk	163	Det	36x6	40x6†	Lav	Mon	75
G. M. C. 101-B	8200	4400	Cont	4	4½x5½	32.4	3	1/16	L	C	McC	FS	Mar	Eism	.....	D	Selec	4	UM	W	Timk	187	Det	36x6	40x6†	Lav	Mon	75
Gramm-Bernstein	8700	5000	Wau	4	4¾x6¾	36.1	3	¼	L	C	T	Sp	Zen	Eism	.....	C	Own	4	Own	W	Shel	168	.....	36x6	40x6†	Ross	Wau	70
Hall	7400	4500	Cont	4	4½x5½	32.4	....	....	L	P	L	FS	Zen	Bosch	.....	L	B-Li	...	K-B	C	Timk	Op	Per	36x4	40x6†	Gem	Dup	.....
Harvey WKA	8900	5000	Buda	4	4½x6	32.4	4	¼	L	P	.....	FS	Strm	Eism	.....	B	B-Li	4	Spic	W	Shel	160	Shel	36x6	40x6†	Ross	Dup	60
Hewitt-Ludlow	8000	5100	Buda	4	4½x6	32.4	.....	.....	.....	.....	.....	.....	Strm	Bosch	.....	B	Cott	4	Spic	C	.....	168	.....	36x6	40x6†	Lav	.....	.....
Hurlburt	7800	5250	Buda	4	4½x6	32.4	3	¼	L	C	T	FS	Flch	Eism	.....	D	B-Li	4	Spic	W	Flot	156	.....	36x5	40x6†	Ross	Dup	.....
Indiana L	8300	4600	Wau	4	4¾x6¾	36.1	3	¼	L	C	T	Sp	Strm	Eism	.....	B	Selec	4	Acme	W	½-Fl	167	S-El	36x5	40x6	Wohl	Wau	78½
Kelly Springfield K-50	9175	4900	Own	4	4½x6½	32.4	3	¼	T	C	Fed	Fo	Rayf	Eism	West	C	Covt	3	Own	C	Dead	150	Per	36x6	40x6†	Gem	Own	93
Kimball	.....	.....	Wis	4	5½x6	42	3	¼	L	C	Flex	Fo	Zen	Berl	.....	L	B-Li	4	Spic	W	Shel	Op	US	36x6	40x12	Ross	Dup	80
Kissel-Goliath	7500	4755	Own	4	4¼x5½	28.9	3	1/16	L	C	McC	Sp	Strm	Eism	.....	W	Warn	4	Spic	W	Shel	180	Shel	36x6	36x6†	Ross	Pier	75
Larrabee-Deyo T	8500	4750	Cont	4	4½x5½	36.1	3	1/16	L	C	Bus	Sp	Strm	Bosch	.....	L	B-Li	4	M	W	Shel	176	Mer	36x6	40x6†	Ross	Pier	.....
Master B	8000	4890	Buda	4	4½x6	32.4	4	¼	L	C	T	FS	Mas	Eism	.....	D	B-Li	4	Spic	W	Timk	170	Det	36x6	40x6†	Ross	Pier	72
Master BL	8200	4900	Buda	4	4½x6	32.4	4	¼	L	C	T	FS	Mas	Eism	.....	D	B-Li	4	Spic	W	Timk	194	Det	36x6	40x6†	Ross	Pier	72
Menominee J	....	4950	Cont	4	4¾x6	32.4	3	1/16	L	C	T	FS	Strm	Eism	.....	F	B-Li	4	Spic	W	Timk	160	Tut	36x6	40x6†	Ross	Mon	80
Moreland 19-J	9000	5350	Cont	4	4¾x6	36.1	3	¼	L	C	Own	Fo	Mill	Dix	.....	D	Selec	4	Ther	W	Timk	192	US	36x6	40x6†	Ross	Cont	.....
Nelson & Le Moon F5	8000	4750	Buda	4	4½x6	32.4	4	¼	L	C	T	Fo	Strm	Bosch	West	L	B-Li	4	Own	W	Timk	Op	Tut	36x6	40x6†	Lav	Mon	80
Old Reliable	8400	5000	Opt	4	5.1x5½	....	3	¼	L	T	T	FS	Strm	Bosch	.....	D	D-Sea	4	Spic	W	Shel	168	Shel	36x5	40x6†	Ross	Opt	.....
Oneida E	9315	4750	Cont	4	5¼x5¾	44.1	3	1/16	L	C	C	FS	Strm	Bosch	Opt	M	Cott	3	Spic	W	Timk	180	Math	36x6	40x12	Ross	Pier	82½
Packard 5-E	8650	5450	Own	4	5 x5½	40	3	¼	L	C	T	Fo	Own	Dix	Bij	D	Selec	4	Spic	W	Flot	186	.....	36x6	40x6	Own	Own	57.2
Parker M-9	8450	5225	.....	4	4¾x6	36.1	3	¼	L	C	Own	Fo	Strm	Bosch	West	L	Warn	4	.....	W	Timk	168	S-El	36x6	40x6†	Ross	.....	85
Pierce-Arrow R-9	8100	5500	Own	4	4¾x6	38.3	4	1/16	T	P	T	Fo	Own	Eism	.....	C	Selec	3	Own	W	Flot	168	S-El	36x5	40x6†	Own	Own	85
Rowe FW	8350	4900	Wis	4	4¾x5½	36.1	4	¼	T	C	May	Fo	Zen	Bosch	.....	L	B-Li	4	M	W	Shel	171	Shel	36x6	40x6	Ross	Simp	57
Royal	....	5000	Wis	4	4¾x5½	36.1	4	¼	T	C	T	....	Strm	Bosch	Opt	....	Own	...	Own	W	Timk	168	Mer	36x6	40x6†	Ross	Mon	.....
Sandow L	7800	4775	Cont	4	4½x5½	32.4	3	1/16	L	P	T	FS	Strm	Bosch	.....	D	B-Li	4	K-B	W	Timk	175	GC	36x6	40x6†	Ross	Mon	71
Sanford 50	7400	4750	Cont	4	4½x5½	32.4	3	1/16	L	P	T	Fo	Strm	Bosch	.....	B	B-Li	4	Spic	W	Shel	174	S-El	36x5	40x6†	Ross	Pier	75
Schacht	8000	4950	Buda	4	4¼x5½	28.9	3	¼	R	P	Own	Fo	Sheb	Bosch	.....	H	Own	3	Hart	W	Own	168	Nat	36x5	40x6†	Own	Dup	70
Selden DL	8800	5000	Cont	4	4½x5½	32.4	3	1/16	L	P	Bus	FS	Strm	Eism	.....	L	B-Li	4	Spic	W	Timk	170	Per	36x6	40x12	Ross	Pier	70
Service 101	8240	5000	Buda	4	4½x6	32.4	3	¼	L	C	T	Fo	Strm	Eism	.....	D	Selec	4	Spic	W	Timk	171	.....	36x6	36x6†	Ross	Simp	75
Signal R	8200	5100	Cont	4	4¾x6	36.1	3	¼	L	C	MeC	FS	Strm	Eism	.....	B	B-Li	4	Spic	W	Timk	180	Per	36x6	40x6†	Lav	Cont	80
Standard 86	8000	4650	Cont	4	4½x5½	32.4	3	1/16	L	C	T	FS	Strm	Eism	.....	D	B-Li	4	Spic	W	Timk	160	.....	36x6	40x6†	Gem	Mon	75
Sterling	9600	5100	Ster	4	4¾x6¾	36.1	3	1/16	L	C	Own	Sp	Rayf	Eism	.....	M	Own	3	Spic	W	Timk	168	Math	36x6	40x6†	Ross	Wau	90
Tiffin	8400	5000	Cont	6	3¾x4¼	33.7	3	1/16	L	C	P	T	FS	Rayf	Bosch	West	D	Covt	3	Acme	W	Shel	168	Kal	36x6	40x6†	Ross	.....	80
Titan	9100	5150	Buda	4	4½x6	32.4	3	¼	L	P	T	Fo	Strm	Eism	.....	D	Cott	4	.....	I	Cl	156	Shel	36x5	40x6†	Lav	Simp	70
Twin City 4 Wheel Dr. A	8000	5250	Wis	4	5¾x6	42	3	¼	T	C	H	FS	Strm	K-W	.....	M	Cott	3	.....	I	½-Fl	140	.....	36x7	.....	Ross	Pier	60
United VX	....	....	Buda	4	5½x6	42	3	¼	T	C	.....	Fo	Strm	Eism	.....	L	B-Li	4	Bld	W	Shel	160	.....	36x5	40x6†	Ross	Simp	80
Vim 24	8500	....	Her	4	4¼x5½	28.9	5	1/16	L	C	T	C	Zen	Dix	.....	D	Selec	4	Spic	W	Shel	150	Shel	36x5	40x5†	Gem	Dup	80
White T G	7925	5000	Own	4	4¼x5¾	28.9	....	....	L	C	T	Fo	Own	Mag	.....	D	Selec	4	Own	DR	Own	174	.....	36x6	40x6†	Own	Own	.....
U. S. K.	8500	4850	Wau	4	4¼x5¾	28.9	....	....	L	C	T	Fo	Own	Mag	.....	D	Selec	3	Opt	W	Shel	168	.....	36x5	40x6†	Lav	Wau	80
Wilcox W	9000	....	Wau	4	4¾x6¾	36.1	3	¼	L	C	T	Sp	.....	.....	.....	C	Selec	4	Spic	W	½-Fl	162	Shel	36x5	40x12	Gem	.....	.....
Wilson H	7500	4600	Cont	4	4½x5½	32.4	3	1/16	L	C	T	FS	Mas	Eism	.....	D	Warn	4	K-B	W	Timk	160	Tut	36x6	40x6†	Ross	Pier	80
Winther 109	8300	5000	Wis	4	4¾x5½	36.1	3	¼	L	C	T	G	Mas	Eism	Bij	B	B-Li	4	Bld	I	Cl	162	Math	36x5	40x6†	Ross	Dup	80
5½, 6 and 7 Ton																												
Doane 1919	8500	5650	Wau	4	4¾x6¾	36.1	3	....	L	C	C	Sp	Mas	Bosch	.....	D	Selec	3	D	C	Dead	178	.....	36x6	40x6†	Lav	Wau	79
Hall	8000	4500	Cont	4	4½x5½	32.4	....	....	L	P	L	FS	Zen	Bosch	.....	....	B-Li	...	K-B	W	Timk	Op	Det	36x5	40x6†	Gem	Dup	.....
Maccar 5½	8200	5000	Wis	4	5.1x5½	41.5	3	¼	T	C	Own	FS	Zen	Bosch	.....	L	B-Li	4	Spic	W	Timk	186	Mer	36x5	40x6†	Ross	Pier	70
Mack AC 5½	8650	5250	Own	4	5 x6	40	2	....	L	C	T	FS	Rayf	Bosch	.....	C	Selec	4	Spic	W	Timk	105	Per	36x5	40x5†	Ross	Simp	50
Garford 6-Ton	9350	5300	Wis	4	5.1x5½	41.5	3	¼	T	C	T	Fo	Rayf	Eism	.....	L	Selec	4	Spic	C	Dead	128	Per	36x6	40x7†	Ross	Simp	.....
Kelly-Springfield K-60	9500	5200	Own	4	4½x6½	32.4	3	¼	T	C	Fed	Fo	Rayf	Eism	West	C	Covt	3	Own	C	Dead	150	Per	36x6	40x7†	Gem	Own	93
Packard 6-E	8925	5700	Own	4	5 x5½	40	3	¼	L	C	T	Fo	Own	Dix	Bij	D	Selec	4	Spic	W	Flot	186	SP	36x6	40x7	Own	Own	58.5
Royal 6	....	5400	Wis	4	5½x6	42.2	....	....	....	....	T	.....	Strm	Bosch	Opt	.....	Own	...	Own	W	Timk	168	Mer	36x6	40x6†	Ross	Mon	.....
Tiffin 6-Ton	9000	5200	Cont	6	3¾x5¼	33.7	3	1/16	L	C	T	FS	Rayf	Bosch	West	D	Covt	3	Acme	W	Shel	168	Kal	36x6	40x12	Ross	.....	80
Winther 129	9000	5250	Wis	4	5½x6	42	3	¼	T	C	T	G	Mas	Eism	Bij	B	B-Li	4	Bld	I	Cl	162	Math	36x6	40x6	Ross	Dup	80
Winther 149	9600	5500	Wis	4	5½x6	42	3	¼	T	C	T	G	Mas	Eism	Bij	B	B-Li	4	Bld	I	Cl	162	Math	36x6	40x14	Ross	Dup	80
Couple Gear 6	11000	7200	Wis	4	5¼x7	44.1	4	1/16	T	G	H	Fo	Strm	Eism	Own	.....	Own	75	Own	Own	Own	144	Tut	36x5†	36x6	Own	.....	65
Mack AC 7½	10950	5500	Own	4	5 x6	40	2	....	L	C	T	FS	Strm	Dix	.....	D	D-Sea	3	.....	C	Dead	Op	.....	36x7	40x7	.....	Own	.....

G. C. M. Model	Chassis Weight	Chassis Price	Engine	No. of Cylinders	Bore and Stroke	Horse Power	Piston Rings Per Cylinder	Piston Ring Groove Width	Valve Location	How Cooled	Radiator Make or Type	Lubrication	Carburetor	Ignition System	Engine Starter	Clutch Make or Type	Transmission	Speeds Forward	Universal	Drive	Rear Axle	Wheelbase	Springs	Front Tires	Rear Tires	Steering Gear	Governor	Pr. Cent of Weight on Rear Wheels
5½, 6 and 7 Ton—Continued																												
Old Reliable CP	10240	6000	Wau	4	4¾x6¾	36.1	3	¼	L	C	T	FS	Strm	Bosch	.....	D	Selec	4	Spic	C	Shel	124	Shel	36x6	40x7†	Ross	Wau	.....
Royal 7	.....	.....	Wis	4	5¼x7	44.2	.....	.....	.....	C	T	.....	Strm	Bosch	Opt	.....	Own	...	.....	W	Timk	168	Mer	36x7	40x7†	Ross	Mon	.....
Sterling 7	11000	5600	Ster	4	4¾x6¾	36.1	3	¼	L	C	Own	Sp	Rayf	Eism	.....	M	Own	3	UM	C	Own	168	Math	36x6	40x7†	Ross	Wau	90
Wichita S	9200	5400	Beav	4	4½x6	32.4	3	¼	O	P	EM	C	Strm	.....	.....	C	Own	4	Own	.....	Own	165	.....	36x6	40x6†	Ross	Dup	.....
Gasoline Tractor-Trucks																												
Columbia T	4000	2350	Cont	4	4⅛x5¼	27.2	3	3/16	L	C	T	FS	Shk	Dix	.....	C	Covt	3	Spic	I	Russ	112	Per	36x4	36x6	Own	Pier	.....
Federal Light-Duty	4100	2500	Cont	4	4⅛x5¼	27.2	3	3/16	L	C	T	Sp	Zen	Eism	.....	B	Own	4	Spic	W	Timk	102	Math	36x3½	36x5	Gem	Mon	80
Federal Heavy-Duty	6800	3475	Cont	4	4½x5½	32.4	3	3/16	L	C	T	Sp	Zen	Eism	.....	B	Own	4	Spic	W	Timk	108	Math	36x5	36x5†	Gem	Mon	80
Garford 70T	4750	3090	Buda	4	4¼x5½	28.9	3	¼	L	C	T	Sp	Rayf	Spld	.....	L	Selec	4	Spic	W	Timk	119	Per	36x4	36x7	Ross	Simp	.....
Garford 77T	6990	4400	Wis	4	4¾x5½	36.1	3	¼	T	C	T	Fo	Rayf	Eism	.....	L	Selec	4	Spic	W	Timk	105	Per	36x5	40x5†	Ross	Simp	.....
Garford 68T	8450	5100	Wis	4	5.1x5½	41.5	3	¼	T	C	T	Fo	Rayf	Eism	.....	L	Selec	4	Spic	C	Dead	102	Per	36x6	40x6†	Ross	Simp	.....
Hewitt-Ludlow 6-Ton	4000	3300	Buda	4	4¼x5½	28.9	.....	.....	.....	.....	T	Fo	Strm	Bosch	.....	B	.....	...	Spic	C	.....	...	.....	36x4	36x4†	Lav	.....	.....
Hood	2900	1300	Own	4	3¾x3¾	22.5	3	¼	T	T	C	Sp	Holl	.....	.....	D	Plan	2	Own	C	Own	60	Lah	20x3½	20x5	Own	.....	65
Knox 35	8500	5500	Own	4	5 x5½	40	4	¼	O	C	Fed	Fo	Zen	Mag	G&D	D	Selec	3	.....	C	Timk	108	.....	36x4	38x6†	Ross	.....	.....
Knox 36 3-Ton	10000	6000	Own	4	5 x5½	40	4	¼	O	C	Fed	Fo	Zen	Mag	G&D	D	Selec	3	.....	C	Timk	108	.....	36x4	38x6†	Ross	.....	.....
Koehler 3-Ton	3000	1750	Own	4	3½x5	19.6	3	3/16	O	T	T	FS	Strm	Eism	.....	D	MM	3	K-B	.....	Torb	106	.....	34x3	34x5	Own	Mon	.....
Koehler 5-Ton	3900	3050	Own	4	4 x5⅛	25.6	3	¼	T	C	T	P	Zen	Eism	.....	D	B-Li	3	Spic	.....	Timk	106	.....	36x4	36x7	Lav	Simp	.....
Kuhn	9000	5000	Wis	4	4¼x5½	28.9	3	3/16	T	C	H	Sp	Rayf	Bosch	.....	C	Selec	4	.....	B	Own	138	.....	36x7	36x7	.....	.....	55
Lapeer (3-Ton)	3050	2000	Wau	4	3½x5¼	19.6	3	¼	L	P	.....	FS	.....	Mag	.....	D	Selec	3	.....	I	Torb	88	.....	34x3½	34x5	Ross	.....	.....
Lapeer (5-Ton)	3400	2700	Wau	4	4 x5¾	25.6	.....	.....	L	P	.....	FS	.....	Mag	.....	D	Selec	3	.....	I	Torb	88	.....	34x3½	34x3½†	Ross	.....	.....
Lombard	8000	....	Spec	6	5½x6¾	72.7	....	.....	.....	C	Spec	Fo	Sheb	.....	Spec	D	Spec	...	.....	W	.....	...	.....	.....	.....	Spec	.....	90
Mack AB (5-Ton)	4900	3100	Own	4	4 x5	25.6	3	.....	L	C	H	FS	Strm	Dix	.....	D	Selec	4	.....	C	Dead	120	.....	36x4	36x4†	.....	Own	47
Mack AC (7-Ton)	7670	4600	Own	4	5 x6	40	2	....	L	C	H	FS	Strm	Dix	.....	D	Selec	3	.....	C	Dead	119	.....	36x5	40x5†	.....	Own	45
Mack AC (11-Ton)	8250	5250	Own	4	5 x6	40	2	....	L	C	H	FS	Strm	Dix	.....	D	Selec	3	.....	C	Dead	119	.....	36x7	40x7†	.....	Own	50
Mack AC (15-Ton)	8650	5500	Own	4	5 x6	40	2	....	L	C	H	FS	Strm	Dix	.....	D	Selec	3	.....	C	Dead	119	.....	36x7	40x7†	.....	Own	50
Rennoc 8-Ton	5050	2850	Buda	4	4⅛x5½	27.2	3	¼	L	C	T	Fo	Strm	Spld	.....	D	Warn	4	Hart	W	Wis	116	Row	36x5	36x7	Lav	Pier	60
Walter 5-Ton "B"	8000	5000	Own	4	4⅝x6	30.6	3	¼	L	P	T	Fo	Strm	Eism	.....	Own	Own	4	Own	I	.....	156	S-El	36x6	40x6	.....	Own	60
Watson	6500	4050	Cont	4	4½x5½	32.4	3	5/16	L	C	Jam	FS	Zen	Bosch	.....	L	B-Li	4	Spic	W	Timk	80	Shel	34x4	36x5†	Gem	Pier	37

Electric Commercial Cars

E. C. M. Name and Model Number	Carrying Capacity	Chassis Weight	Chassis Price	Maximum Speed	Battery	Mileage Per Charge	Motor	Controller	Speeds Forward	Drive	Rear Axle	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Per Cent Weight on Rear Wheels
Ward WS	750	1400	.....	12	Edis	45	West	West	4	B	Timk	Shel	32x2½	32x3	Own	88	60
C. T. 1	1000	1800	2270	14	Opt	60	G-E	Own	4	Ct	Flot	Shel	36x3	36x3	W	90	60
Walker M	1000	2300	.....	15	Opt	60	West	West	5	O	Own	Math	34x3	36x3½	Ross	93	66
Atlantic 1C	2000	2770	.....	12	Opt	.....	G-E	G-E	4	C	Timk	S-El	34x4	36x4	Ross	103	65
Ward WA	1000	2730	.....	12	Edis	47	G-E	G-E	4	W	Shel	Shel	32x3	32x4	Own	90	60
C. T. 2	2000	2500	2745	13	Opt	60	G-E	Own	4	Ct	Flot	Shel	36x3½	36x4	W	100	60
Walker K	2000	2500	.....	14	Opt	60	West	West	5	O	Own	Math	34x3½	36x4	Ross	96	66
Ward WB	2000	3420	.....	10	Edis	43	G-E	G-E	4	W	Shel	Shel	32x3½	36x4	Own	102	60
Atlantic 2C	4000	3590	.....	11	Opt	.....	G-E	G-E	4	C	Timk	S-El	34x4	36x3†	Ross	115	65
C. T. 3	4000	3500	3270	11	Opt	60	G-E	Own	4	Ct	Flot	Shel	36x4	36x4†	W	116	60
Walker L	4000	3700	.....	13	Opt	60	West	West	5	O	Own	Math	38x4	38x6	Ross	112	66
Ward WD	4000	4500	.....	8.5	Edis	35	G-E	G-E	4	W	Shel	Shel	36x4	38x6	Own	114	60
Atlantic 3C	7000	5220	.....	10	Opt	.....	G-E	G-E	5	C	Timk	.....	36x5	40x4†	Ross	135	65
C. T. 4	7000	5000	4595	10	Opt	50	G-E	Own	4	I	Dead	Shel	36x3½†	36x4†	W	122	55
Ward WF	7000	6600	.....	7	Edis	30	G-E	G-E	4	W	Shel	Shel	36x5	36x8	Own	132	60
Atlantic 5C	10000	6230	.....	9	Opt	.....	G-E	G-E	5	C	Timk	S-El	36x6	40x5†	Ross	144	65
Couple Gear	10000	9000	5800	10	Phil	30	Own	Own	5	B	Own	Tut	36x5†	36x5†	Own	96	55
Couple Gear	14000	10000	4800	7	Phil	30	Own	Own	5	B	Timk	Tut	36x5†	36x5†	Own	96	75
C. T. 5	10000	6000	5240	8	Opt	50	G-E	Own	4	I	Dead	Shel	36x4	36x5†	W	132	55
Walker P	7000	5300	.....	11	Opt	50	West	West	5	O	Own	Math	36x5	38x5†	Ross	131	66
Walker N	10000	6300	.....	10	Opt	50	West	West	5	O	Own	Math	36x6	38x6	Ross	141	66
Ward WH	10000	8375	.....	6	Edis	26	G-E	G-E	4	W	Shel	Shel	36x7	40x10	Own	144	60
Couple Gear	14000	12000	5400	7	Phil	30	Own	Own	5	B	Timk	Tut	36x5	38x7	Own	194	75
Atlantic 6C	13000	6940	.....	8	Opt	.....	G-E	G-E	5	C	Timk	S-El	36x6	40x6†	Ross	156	65
Couple Gear	14000	10000	6500	10	Phil	30	Own	Own	5	B	Own	Tut	36x5†	36x5†	Own	96	55

Manufacturers Whose Models Are Included in Specifications on Preceding Pages

Acason—Acason Motor Truck Co., Detroit, Mich.
Ace—American Motor Truck Co., Newark, Ohio.
Acme—Acme Motor Truck Co., Cadillac, Mich.
All-American—All-American Truck Co., Chicago, Ill.
Armleder—O. Armleder Co., Cincinnati, Ohio.
Atlantic—Atlantic Electric Vehicle Co., Newark, N. J.
Atlas—Martin Truck & Body Corp., York, Pa.
Atterbury—Atterbury Motor Car Co., Buffalo, N. Y.
Autocar—Autocar Co., Ardmore, Pa.
Available—Available Truck Co., Chicago, Ill.
Beck-Hawkeye—Beck-Hawkeye Motor Truck Wks., Cedar Rapids, Iowa.
Bessemer—Bessemer Motor Truck Co., Grove City, Pa.
Bethlehem—Bethlehem Motors Corp., Allentown, Pa.
Brinton—Brinton Motor Truck Co., Philadelphia, Pa.
Briscoe—Briscoe Motor Corp., Jackson, Mich.
Brockway—Brockway Motor Truck Co., Cortland, N. Y.
C. T.—Commercial Truck Co. of America, Philadelphia, Pa.
Chevrolet—Chevrolet Motor Co. of Mich., Flint, Mich.
Clydesdale—Clyde Cars Co., Clyde, Ohio.
Collier—Collier Motor Truck Co., Bellevue, Ohio.
Columbia—Columbia Motor Truck and Trailer Co., Pontiac, Mich.
Comet—Comet Automobile Co., 156 S. Water St., Decatur, Ill.
Commerce—Commerce Motor Car Co., Detroit, Mich.
Concord—Abbot-Downing Truck & Body Co., Concord, N. H.
Conestoga—Conestoga Motor Truck Co., Lancaster, Pa.
Corbitt—Corbitt Motor Truck Co., Henderson, N. C.
Corliss—Corliss Motor Truck Co., Corliss, Wis.
Couple Gear—Couple Gear Freight Wheel Co., Grand Rapids, Mich.
Dart—Dart Truck & Tractor Corp., Waterloo, Ia.
Day-Elder—Day-Elder Motors Corp., Newark, N. J.
Dearborn—Dearborn Truck Co., Chicago, Ill.
Defiance—Turnbull Motor Truck & Wagon Co., Defiance, Ohio.
DeKalb—DeKalb Wagon Co., DeKalb, Ill.
Denby—Denby Motor Truck Co., Detroit, Mich.
Diamond T—Diamond T Motor Car Co., Chicago, Ill.
Diehl—Diehl Motor Truck Works, Philadelphia, Pa.
Dispatch—Dispatch Motor Car Co., Minneapolis, Minn.
Doane—Doane Motor Truck Co., San Francisco, Cal.
Dodge—Dodge Bros., Detroit, Mich.
Dorris—Dorris Motor Car Co., St. Louis, Mo.
Douglas—Douglas Motors Corp., Omaha, Nebr.
Duplex—Duplex Truck Co., Lansing, Mich.
Ellsworth—Mills-Ellsworth Co., Keokuk, Ia.
F. W. D.—Four Wheel Drive Auto Co., Clintonville, Wis.
Fageol—Fageol Motors Co., Oakland, Cal.
Famous—Famous Trucks, Inc., St. Joseph, Mich.
Fargo—Fargo Motor Truck Co., Chicago, Ill.
Federal—Federal Motor Truck Co., Detroit, Mich.
Ford—Ford Motor Co., Highland Park, Mich.
Forschler—Forschler Motor Truck Mfg. Co., New Orleans, La.
Fulton—Fulton Motor Truck Co., Farmingdale, L. I., N. Y.
G. M. C.—General Motors Truck Co., Pontiac, Mich.
Gabriel—W. H. Gabriel Carriage & Wagon Co., Cleveland, Ohio.
Garford—Garford Motor Truck Co., Lima, Ohio.
Gary—Gary Motor Truck Co., Gary, Ind.
Gersix—Gersix Mfg. Co., Seattle, Wash.
Giant—Giant Truck Corp., Chicago Heights, Ill.
Gramm-Bernstein—Gramm-Bernstein Motor Truck Co., Lima, Ohio.
Grant—Grant Motor Car Corp., Truck Division, Cleveland, Ohio.
Hahn—Hahn Motor Truck & Wagon Co., Hamburg, Pa.
Hall—Lewis-Hall Iron Works, Detroit, Mich.
Harvey—Harvey Motor Truck Co., Harvey, Ill.
Hawkeye—Hawkeye Truck Co., Sioux City, Ia.
Hendrickson—Hendrickson Motor Truck Co., Chicago, Ill.
Hewitt-Ludlow—Ralston Iron Works, San Francisco, Cal.
Higrade—Higrade Motors Co., Harbor Springs, Mich.
Hood—Hood Mfg. Co., Seattle, Wash.
Hoover—Hoover Wagon Co., York, Pa.
Huffman—Huffman Bros. Co., Elkhart, Ind.
Hurlburt—Hurlburt Motor Truck Co., New York, N. Y.
Independent—Independent Motor Co., Youngstown, Ohio.
Indiana—Indiana Truck Corp., Marion, Ind.
International—International Harvester Co., Chicago, Ill.
Jones—Jones Motor Car Co., Wichita, Kans.
Jumbo—Nelson Motor Truck Co., Saginaw, Mich.
Kankakee—Kankakee Automobile Co., Kankakee, Ill.
Kelly-Springfield—Kelly-Springfield Motor Truck Co., Springfield, Ohio.
Kimball—Kimball Motor Truck Co., Los Angeles, Cal.
King Zeitler—King Zeitler Co., Chicago, Ill.
Kissel—Kissel Motor Car Co., Hartford, Wis.
Knox—Knox Motors Co., Springfield, Mass.
Koehler—H. J. Koehler Motors Corp., Newark, N. J.
Kuhn—Kuhn Tractor Truck Co., Seattle, Washington.
Lane—Kalamazoo Motor Corp., Kalamazoo, Mich.
Lange—Lange Motor Truck Co., Pittsburgh, Pa.
Lapeer—Lapeer Tractor-Truck Co., Lapeer, Mich.
Larrabee-Deyo—Larrabee-Deyo Motor Truck Co., Inc., Binghamton, N. Y.
Lombard—Lombard Auto Tractor Truck Corp., New York, N. Y.
Luverne—Luverne Automobile Co., Luverne, Minn.
Maccar—Maccar Truck Co., Scranton, Pa.
Mack—International Motor Co., New York, N. Y.
Manly—O'Connell-Manly Truck Co., Waukegan, Ill.
Master—Master Trucks, Inc., Chicago, Ill.
Maxwell—Maxwell Motor Co., Inc., Detroit, Mich.
Menominee—Menominee Motor Truck Co., Menominee, Mich.
Minnesota—Minnesota Machinery & Foundry Co., Minneapolis, Minn.
Moore—Moore Motor Vehicle Co., Danville, Ill.
Moreland—Moreland Motor Truck Co., Los Angeles, Cal.
Muskegon—Muskegon Engine Co., Muskegon, Mich.
Myers—E. A. Myers Co., Pittsburgh, Pa.
Napoleon—Napoleon Motors Co., Traverse City, Mich.
Nash—Nash Motors Co., Kenosha, Wis.
Nelson-LeMoon—Nelson & Le Moon, Chicago, Ill.
Netco—New England Truck Co., Fitchburg, Mass.
Noble—Noble Motor Truck Co., Kendallville, Ind.
Norwalk—Norwalk Motor Car Co., Martinsburg, W. Va.
Northwestern—Starr Carriage Co., Seattle, Wash.
O. K.—Oklahoma Auto Mfg. Co., North Muskogee, Okla.
Ogden—Ogden Motor & Supply Co., Chicago, Ill.
Old Hickory—Kentucky Wagon Mfg. Co., Louisville, Ky.
Old Reliable—Old Reliable Motor Truck Co., Chicago, Ill.
Oneida—Oneida Motor Truck Co., Green Bay, Wis.
Oshkosh—Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis.
Overland—Willys-Overland Co., Inc., Toledo, Ohio.
Packard—Packard Motor Car Co., Detroit, Mich.
Paige—Paige-Detroit Motor Car Co., Detroit, Mich.
Panhard—Panhard Motors Co., Grand Haven, Mich.
Parker—Parker Motor Truck Co., Milwaukee, Wis.
Patriot—Hebb Motors Co., Lincoln, Nebr.
Piedmont—Piedmont Motor Car Co., Inc., Lynchburg, Va
Pierce-Arrow—Pierce-Arrow Motor Car Co., Buffalo, N. Y.
Pittsburgher—Sawders-Murray Co., Pittsburgh, Pa.
Rainier—Rainier Motor Corp., Flushing, L. I., N. Y.
Reliance—Reliance Motor Truck Co., Appleton, Wis.
Rennoc—Rennoc-Leslie Motor Co., Philadelphia, Pa.
Reo—Reo Motor Car Co., Lansing, Mich.
Republic—Republic Motor Truck Co., Inc., Alma, Mich.
Riker—Locomobile Co. of America, Bridgeport, Conn.
Rock Falls—Rock Falls Mfg. Co., Sterling, Ill.
Rowe—Rowe Motor Mfg. Co., Lancaster, Pa.
Royal—Royal Motor Truck of N. Y., New York, N. Y.
Sandow—Sandow Motor Truck Co., Chicago, Ill.
Sanford—Sanford Motor Truck Co., Syracuse, N. Y.
Schacht—G. A. Schacht Motor Truck Co., Cincinnati, Ohio.
Schwartz—Schwartz Motor Truck Co., Reading, Pa.
Selden—Selden Motor Vehicle Co., Rochester, N. Y.
Service—Service Motor Truck Co., Wabash, Ind.
Shaw—Walden W. Shaw Livery Co., Chicago, Ill.
Signal—Signal Motor Truck Co., Detroit, Mich.
Standard—Standard Motor Truck Co., Detroit, Mich.
Sterling—Sterling Motor Truck Co., Milwaukee, Wis.
Stewart—Stewart Motor Corp., Buffalo, N. Y.
Sullivan—Sullivan Motor Truck Corp., Rochester, N. Y.
Superior—Superior Motor Truck Co., Atlanta, Ga.
Texan—Texas Motor Car Asso., Fort Worth, Tex.
Tiffin—Tiffin Wagon Co., Tiffin, Ohio.
Titan—Titan Truck Co., Milwaukee, Wis.
Tower—Tower Motor Truck Co., Greenville, Mich.
Traffic—Traffic Motor Truck Corp., St. Louis, Mo.
Transport—Transport Truck Co., Mt. Pleasant, Mich.
Triangle—Triangle Motor Truck Co., St. Johns, Mich.
Twin City—Twin City Four Wheel Drive Co., Inc., St. Paul, Minn.
Union—Union Motor Truck Co., Bay City, Mich.
United—United Motors Co., Grand Rapids, Mich.
U. S.—United States Motor Truck Co., Cincinnati, Ohio.
Velie—Velie Motors Corp., Moline, Ill.
Victor—Victor Motor Truck & Trailer Co., Chicago, Ill.
Vim—Vim Motor Truck Co., Philadelphia, Pa.
Walker—Walker Vehicle Co., Chicago, Ill.
Ward—Ward Motor Vehicle Co., Mt. Vernon, N. Y.
Ward La France—Ward La France Truck Co., Inc., Elmira, N. Y.
Walter—Walter Motor Truck Co., New York, N. Y.
Watson—Watson Wagon Co., Canastota, N. Y.
White—White Motor Co., Cleveland, Ohio.
White Hickory—White Hickory Wagon Mfg. Co., Atlanta, Ga.
Wichita—Wichita Falls Motor Co., Wichita Falls, Tex.
Wilcox—H. E. Wilcox Motor Co., Minneapolis, Minn.
Wilson—J. C. Wilson Co., Detroit, Mich.
Winther—Winther Motor Truck Co., Kenosha, Wis.
Witt Will—Witt-Will Co., Inc., Washington, D. C.
Wolverine—American Commercial Car Co., Detroit, Mich.

Circular on Electrical Precipitation.—Westinghouse Department of Publicity, East Pittsburgh, Pa. This circular describes the Westinghouse achievements in the field of electrical precipitation. The process applies to copper, lead or zinc smelters, blast furnaces, chemical, acid and cement plants for the recovery of valuable material otherwise wasted. The necessary apparatus for the precipitation process such as motor-generators, transformers, rectifiers, motors, switchboard and accessories are shown installed and described in detail in the circular. The number of the circular is 7375.

The Southern Motor Manufacturing Association, Ltd., of Houston, Texas, has opened a branch office in Memphis under the management of H. A. Decker, formerly of Shreveport, La.

Only tractors and trucks now are being put on the market by the company, but when the complete line is in production the Southern Motor Manufacturing Association will have lines of trailers and bodies besides the present stock of trucks and trailers. All products of the firm are branded "Ranger." The name concern, Texas, where the association was organized nearly two years ago.

Foreign offices have been established in London, in Cuba, at various points in South America and other foreign centers. Truck and trailer lines now are offered at the Memphis branch.

A strong movement has been inaugurated in Rhode Island to obtain funds for the improvement of 225 miles of main state highways. It is estimated that $7,000,000 will be necessary to bring these roads back to heavy duty standards.

NEW COMMERCIAL CARS

Diamond T Announces New Farm Special Model

IN keeping with its progressive policy, the Diamond T Motor Car Co., of Chicago, has announced a new Farm Special truck of 1½-ton capacity, which, as its name implies, is designed especially to meet the all 'round requirements of the American farmer. Strength and power are the fundamentals of its design, and a glance at the specifications will indicate that, in this truck, the farmer will find an all-purpose vehicle for his daily work that will give him big value for many years.

The Diamond T Farm Special is to sell at $2295.

The engine in the new truck is of special design for this particular line, and consists of a unit power plant of four cylinders, cast enbloc, each having a bore of 3¾ in. and stroke of 5¼ in. S. A. E. rating gives the motor 22½ hp. Valves are all on the right side, each 1¾ in. in diameter in the clear. Cylinder head casting is removable. The combustion chambers, intake passages and hot spot manifold are all designed to efficiently utilize the present low grade of gasoline. A 1 in. Stromberg carburetor is used, taking air by metal hose through a hot stove attachment to exhaust pipe.

Connecting rod bearings are large; 2⅛ in. x 2¼ in. at the lower end and 1⅛ in. x 1¾ in. at upper end. The main shaft bearings are also ample; 2⅛ in. x 2¼ in. at the front and 2¾ in. x 3 in. at center and rear. The flywheel, 16 in. in diameter, weighs 78 lb. Crankcase is of cast iron, with aluminum oil pan. Provision is made in the crankcase design for mounting the starting motor and electric generator, but these are not standard equipment on this model.

A specially designed centrifugal governor is driven from a gear on the pump shaft. A lever arrangement makes it possible to set the governor for varying maximum speeds.

Cooling is accomplished by the standard Diamond T fin and tube radiator, with water driven by centrifugal pump on left side of engine. The radiator is mounted in cast iron shell, protected from rebound shocks by the standard spring mounting used by this company. The water capacity of the cooling system is six gallons.

An Oakes four-bladed fan, 16 in. in diameter, with screw adjustment of belt tension, is driven from the forward end of the pump shaft, a 2-in. belt being used. This is an unusually wide belt for this type of work.

A Bosch DU4 magneto, with impulse starter, is connected direct to the pump shaft by flexible coupling. The ignition cable mounting on this engine follows the well-tried-out system in use on Class B army truck engines during the war.

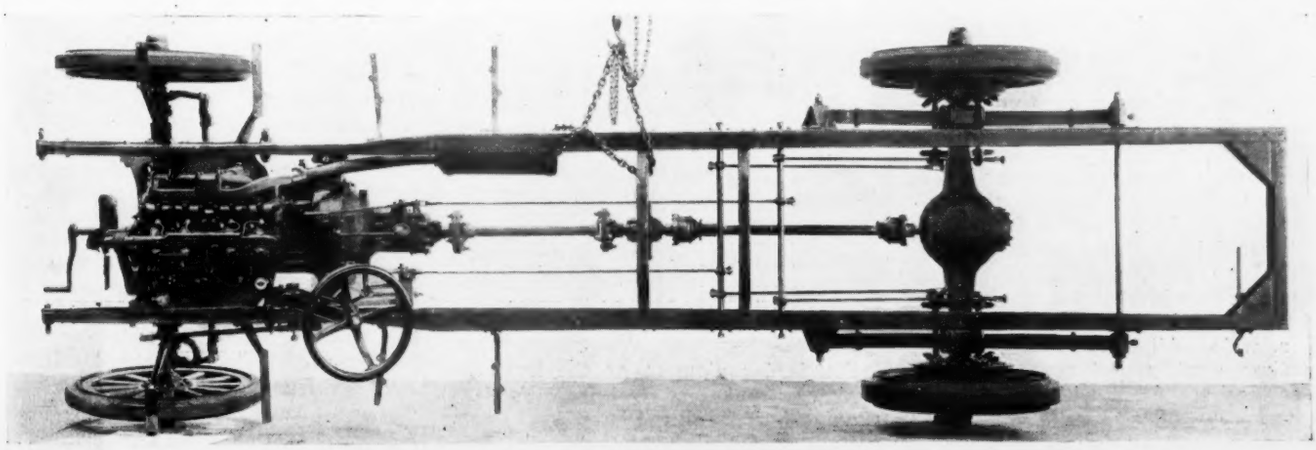
The engine unit has the usual Diamond T three-point suspension, flexible trunnion support aft and a new design of transverse cast support forward.

The clutch is of the multiple disc type, steel plates against Raybestos, and runs dry. Transmission is of the selective type, having three forward speeds.

To do away with the long propeller shaft which would otherwise be neces-

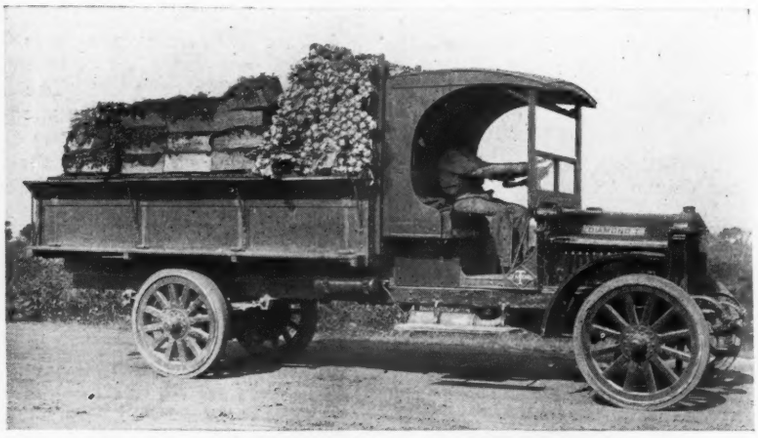


Showing the Grain-Tight Extension Fitted to the Express Body. Note the Running-board Which Extends the Entire Length of the Truck, Making Loading Easy



Plan View of Chassis of the New Diamond T Farm Special

sary with a truck of this length, an intermediate driving shaft is mounted between the transmission and the propeller shaft proper. This shaft is of special heat treated steel, welded to the spiders of Thermoid-Hardy universal joints at each end. A special Diamond T bearing carrier is supported by a pressed steel transverse member between the ends of the two shafts, and the main propeller shaft has Spicer universal joints at each end, with slip joint to allow for spring action. This shaft assembly provides a maximum of flexibility between engine and rear axle.



The One and a Half Ton Diamond T Farm Special in Use

A Timken Detroit rear axle is used, with David Brown worm drive. The standard gear ratio furnished is 7¾ to 1, although 9¼ to 1 is optional where more power is required. With the standard gear ratio, speed of the truck on 36-in. solid tires is 18 miles per hour, and with pneumatics 20 miles per hour. With the lower gear ratio the speed drops to 16 and 17 miles per hour on solid and pneumatic tires, respectively.

The Timken duplex system of brakes is used, double internal expanding on rear wheel drums. The front axle is also of Timken make.

The frame of the Farm Special is pressed from strip steel and is 5⅝ in. deep most of its length. Flanges at their widest part are 3 9-16 in. wide, tapering to 1⅞ in. forward and 2¼ in. at rear end. The engine supports, two pressed steel transverse stiffeners amidships and a pressed steel member at the rear, secured to the side frames by riveted gussets at each corner, top and bottom, make the frame especially strong and well braced.

Special attention has been given to the selection of springs for this truck, with a view to furnishing springs that will withstand the hard usage a farm truck gets over fields and bad roads. Mather springs are used, semi-elliptic, 40 in. long in front, with 8 leaves 2¼ in. wide, and 53 in. long in the rear, with 10 leaves 2½ in. wide. All leaves are of chrome vanadium steel, tested separately, and all springs are fitted with extra heavy rebound clips. Spring eyes are bushed with bronze and all spring bolts are of special steel.

Steering gear is of the worm and wheel type, with adjustment for taking up slack. Wheels are of wood, S. A. E. standard for 36-in. tires, with twelve 2-in. spokes in front and twelve spokes, 2¼ in. square, in rear. Wheelbase is 144 in., with 56 in. tread. Solid tires, 36 x 3½ front and 36 x 5 rear, are standard equipment. If pneumatics are used the company recommends 35 x 5 front and 38 x 7 rear.

The body and truck complete weigh 5100 lb., of which 2450 lb. is on the front wheels and 2650 lb. on the rear.

A steel gasoline tank holding 18 gallons is fitted under the driver's seat, fed through a vacuum system to the engine.

The combination all-purpose farm body furnished with the truck is exceptionally well planned. As an express body, it measures 120 in. x 60 in., with body 15 in. high. Flare boards are 9 in. wide, heavily ironed. An outside running board, 6 in. wide, extends the length of the body, making it easy to stand on the outside of the truck for loading, etc. The capacity of the express body is 62.5 cu. ft.

On this body may be fitted a grain tight extension, 9 in. high, beveled to make a tight fit against the flare boards of the express body. This gives the body a capacity of 100 cu. ft.

A cattle rack may be substituted for the grain extension, 54 in. high from truck platform, with 14 in. space between the two top panels to accommodate the heads of cattle being hauled.

Figures showing the weights of various materials when these bodies are filled are interesting. They follow:

	Express Type Body	Grain-tight Body
	Lb.	Lb.
Barley	2,438	3,900
Corn	2,813	4,500
Oats	1,623	2,600
Potatoes	2,625	4,200
Rye	2,812	4,500
Wheat	3,000	4,800
Coal	3,120	.....
Gravel	5,900	.....
Eggs	2,480, or 40 crates	
Milk	3,620, or 32 10-gal. cans	

Standard equipment on the truck includes extra heavy steel front fenders, running boards, oil tail lamp, horn, complete set of tools with jack, tool box, and seat. Cab with side curtains and wind shield are also furnished and side oil lamps of more than the usual candle power.

It would seem from a perusal of the specifications of this Farm Special truck that the Diamond T Co. has evolved a motor truck that will meet with ready sale among the better class of farmers. The design of both truck and body shows the result of careful investigation of the requirements of the modern farmer along these lines. The Diamond T factory at Chicago is already in production on this new type.

Commerce Can Supply Complete Range of Bodies

Following a recent announcement by the Commerce Motor Car Co., of Detroit, of the addition of an all-purpose body, handling all farm and a large number of city transportation problems, comes the statement that they have also added another body, designated as a steel combination economy dump or express body.

This gives to this company quite a range of bodies for their 1-1½- and 1½-2-ton chassis. The steel dump or express body has a simple worm and gear hoist, and a capacity of 54 cu. ft. It is adapted for a pick-up truck with every fleet of heavy dump trucks, and has numerous uses around an industrial plant, as a carrier of coal, grain, building materials, etc. The body has a reversible tail gate equipped with sliding scuttle door for discharging part loads. The hoist in no way interferes with the body when it is used as an express vehicle.

In addition to the combination economy steel dump and express body, the Commerce Motor Car Co. has another express body, a stake body, canopy top express body and the Every Way body as standard factory equipment.

Service Motor Truck Co., Wabash, Ind., has announced a unique prize contest in which all its dealers, distributors and representatives are invited to participate. The dealer, distributor or representative whose business for the period between July 1 and December 31, 1919, exceeds that of every other sales organization, in percentage, over the quota set for him by the company, will receive a 90 hp. Canadian J. N. 4 airplane, and in addition will be entitled to a free course of training at the Service aviation field.

Kalamazoo Motors Corp., Kalamazoo, Mich., announces that it is now building 1½-, 2½- and 3½-ton trucks. The line will be known as the "Kalamazoo." Officers of this company, which recently took over the Lane Motor Truck Co., are: H. A. Crawford, president; C. J. Johnson, vice-president; R. M. Gregory, secretary; Wm. B. Milham, treasurer, and H. G. Stiles, sales manager. The directors are: W. B. Milham, V. T. Barker, C. J. Johnson, H. P. Kauffer, F. H. Milham, J. E. Brown, John McKinnon, A. L. Pratt and H. A. Crawford.

Hudson Motor Specialties Co., Phila., Pa., announces that the Canadian patent on the Hudson Crank Case Repair Arm was issued May 13, 1919.

The Harvey One and a Half to Two-Ton Pneumatic Speed Job

THE Harvey Motor Truck Co., of Harvey, Ill., announces a new model designed especially for pneumatic tire equipment. The standard tire equipment includes 36 x 6 in. front and 40 x 8 in. rear Goodyear cord pneumatics. Air is provided by a Kellogg pump mounted integral with the transmission, the air being piped to the dash. A 15-ft. wire-wrapped hose is part of the tool box equipment. This job is governed at 22 m.p.h. The wheelbase is 128 in., resolving itself into what the makers term, a close-coupled job, permitting a short turning radius. The engine is mounted directly over the front axle. The weight of this model is 3850 lb.

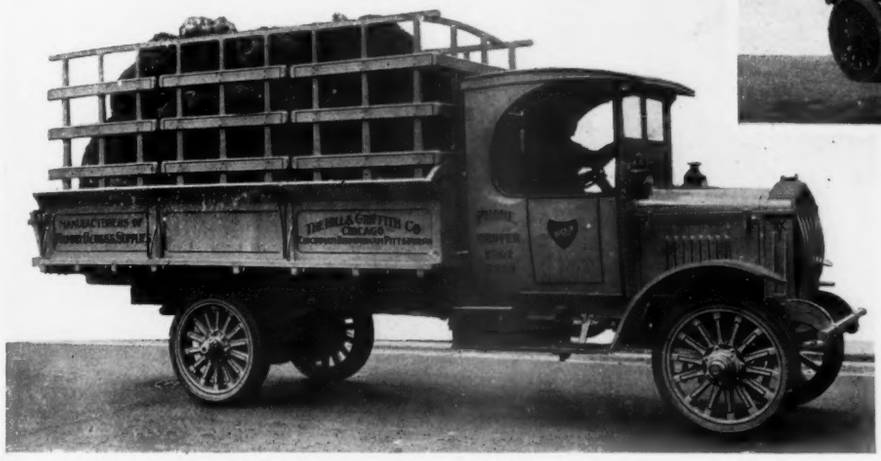
Specifications of the new model include a Buda, heavy duty 4-cylinder engine, 4⅛ bore by 5½ stroke; ignition by Bosch high tension magneto; carburetion is cared for by Zenith 1¼ in. carburetor. The gasoline tank is of 22 gallons capacity. Transmission is a Fuller, three speeds forward; clutch is multiple disc, dry plate type. The propeller shaft is of two piece tubular construction fitted with three universal joints suspended in S. K. F. self-aligning bearing attached to cross member. The springs are 2½-ton Sheldon, 44 x 2½ in. front, 56 x 3 in. rear; the oversize spring equipment gives exceptional riding qualities in connection with the pneumatic tires; the front and rear axles are Sheldon make, the rear being a N-103. The frame is of Parish & Bingham make, dimensions 5 x 2½ x ¼ in. The steering gear is a Ross, irreversible type, left side drive with center control; the height of the frame is 2 ft. 7½ in. (from ground loaded) length; back of driver's cab, 10 ft., and width of frame, 32 in.

The price is $2850, painted in the lead Equipment includes pneumatic tires, driver's seat, side and tail lamps, horn, jack and full set of tools.

This company, which has been building trucks since 1911, calls attention to the fact that it is now making a complete line of truck models, including 1½-ton solid tire job, listing at $2350; 2½, 3½, 5-ton models and 5, 7½ and 10-ton tractor models. Specifications of these models appear in our specification tables in this issue.

Express Body Mounted on the Harvey Chassis





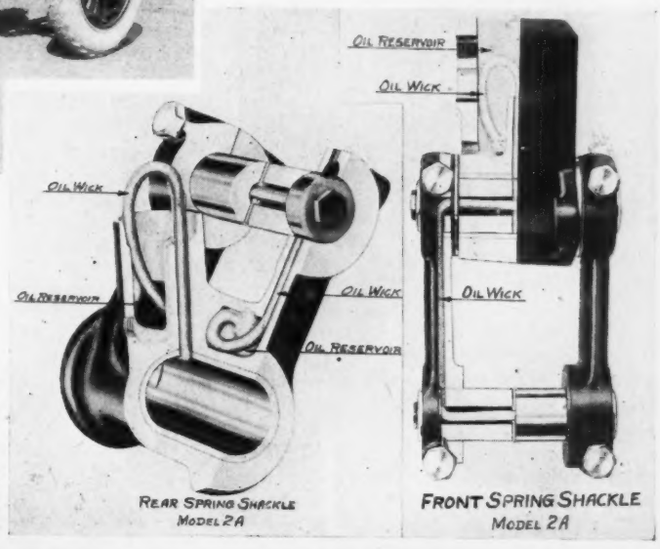


Upper: Stake Body Mounted on the One and a Half Ton Chassis

Lower: Showing the Chassis With the Standard Pneumatic Tire Equipment

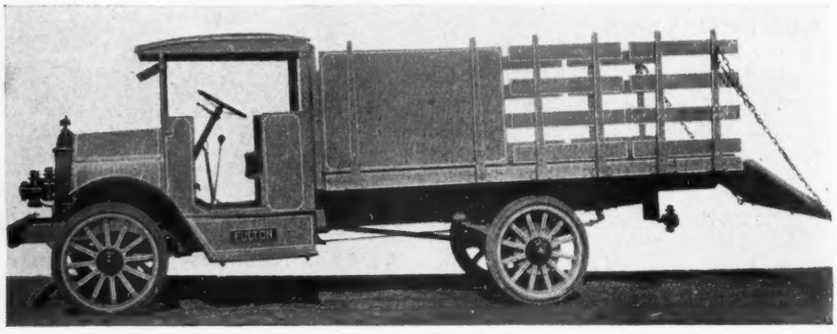
Wick Oiling on Ward LaFrance Spring Shackles

The illustration shows how the spring shackles on Ward LaFrance trucks, built by the Ward La France Truck Company, of Elmira, New York, are oiled. The oil feeds to the center of the bearings and flows somewhat more freely while the truck is in motion and causes oil from the upper pin or bolt to creep out onto the spring and follow down the several leaves to the saddle, thus lubricating the truck springs. The reservoirs require filling every week to every three weeks, according to the truck mileage. Only clean oil is used.



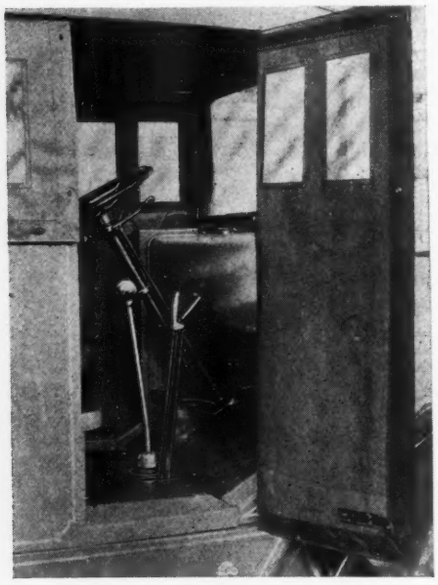
Fulton Model C Now Rated at Two Tons

Slight changes and improvements in the Fulton Model FX 1½-ton truck, which was described on page 56 of the COMMERCIAL CAR JOURNAL for January, 1918, have resulted in a new model known as the Model "C." This is now given a capacity rating of 1½ to 2 tons.



The Improved Model C Fulton Truck With Stake Rack Body

The four-cylinder Herschell-Spillman engine of 3¼ x 5 in. bore and stroke is still used. The Carter carburetor equipped with the triple heated gas feature has been retained. An added feature is the choker valve which can be controlled either from the front of the radiator or from the steering column. The radiator has been increased slightly in size without any alteration in its shape, which is claimed to permit a satisfactory fan sweep while allowing the use of a larger fan than could otherwise be used. The radiator filler cap is now oblong in shape and is hinged to the top of the radiator so that it cannot be lost. Thick rubber pads to absorb road shocks are used between the radiator and frame.



Steel Cab is Now Standard Equipment on the Model C Fulton

A Simms high tension magneto replaces the make formerly used. Some changes in the transmission permit of power-take-offs for hydraulic hoists, winches, dumping bodies, etc., or for a mechanical tire pump. A two-piece propeller shaft fitted with three universal joints is now used.

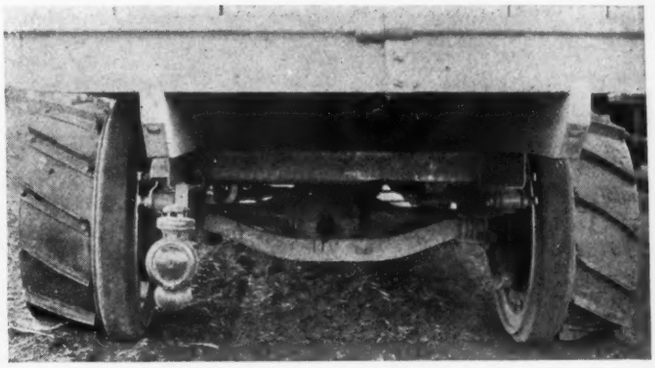
The method of lubricating the different moving parts of the steering mechanism from the steering column to the front wheels has been improved by the use of snap-covered oil cups. A six-inch steel bumper is now built in as a part of the frame at the front end. The wheelbase has been increased 1 in., making it now 137 in. Rear springs have rebound plates to minimize spring breakages.

Service brakes operate on 16 in. diam. drums, with 3½-in. faces, mounted on the rear wheels. The emergency brake operates on the propeller shaft back of the transmission. The drum is 8 in. diam. with a 3-in. surface.

While standard tire equipment is 34 x 3½ in. solids in front and 34 x 5 in. solids in the rear, the model "C" may be equipped with 35 x 5 in. pneumatics in front and 38 x 7 in. pneumatics in the rear, at a slight additional cost if specified when the truck is ordered.

The fuel tank capacity has been increased to 20 gal. A steel cab over the driver's seat now forms part of the standard equipment. The top and sides of the cab are removable for fair weather and for bad weather side curtains are provided which can be swung open like doors. A heavy plate glass windshield possessing both rain vision and ventilating features, is used. Driver's seat cushion is of 8 in. depth and space has been left in the back of the seat for books, records, gloves, etc.

"Ground grippers" or auxiliary wheels fitted with cleats or lugs for running on soft roads or in plowed fields, may be obtained as extra equipment for $100. It is claimed that these can be attached to the regular wheels in from 10 to 15 minutes' time. The grippers for use on the regular rear wheels have diagonal flanges and are 9 in. wide while those for the front wheels are smooth and 4½ in. wide.



The "Ground-Grippers," Offered as Extra Equipment for Use on Soft Ground.

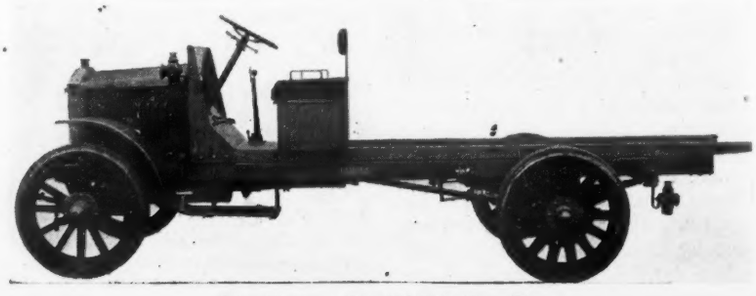
An acetylene searchlight to be operated from the inside of the cab can also be supplied as extra equipment.

The weight of the Model "C" chassis, including cab, is 3500 lb. and the price $2150 f.o.b. factory.

Famous Trucks in Two Models

The Model B-10 one-ton and Model B-12 1½-ton Famous trucks are built by Famous Trucks, Inc., St. Joseph, Mich. Both models are practically identical in design, except for slight differences in size.

Continental 4-cylinder engines are employed in both models, the smaller one



The Famous Model B10 One-Ton

having 3½-in. bore and 5-in. stroke, while the engine in the larger model has 3¾-in. bore, the stroke being the same as in the smaller machine. A Stromberg type "M" carburetor is used and ignition is furnished by an Eisemann high tension magneto, type "GS." A multiple disc dry clutch and a Fuller three-speed and reverse selective transmission transmit the power to the drive shaft, which is fitted with two universal joints, and then to a Clark internal gear type rear axle. Hotchkiss drive is employed through semi-elliptic rear springs. The front springs also are semi-elliptics.

The wheels are regularly equipped with 36 x 3½-in. single solid tires in front for both models, and 36 x 4-in. single solids on the rear of the one-ton truck, with 36 x 5-in. on the 1½-ton model. A Ross steering gear is used with left-hand drive and center control. Thermo-syphon cooling is employed with a radiator of the cast tank, vertical tube type.

Both emergency and service brakes are of the contracting type, the former operating on rear wheel drums and the latter on the rear end of the transmission. A Monarch governor is used, limiting speed of the smaller model to 18 m.p.h. and the larger model to 16 miles.

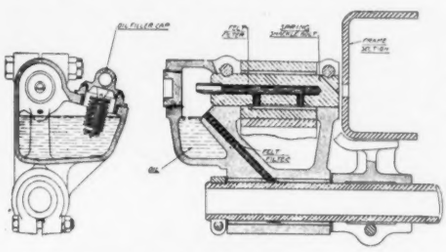
The gear ratio in the rear axle is 7 to 1 on both models. The wheelbase is 120 in. on the smaller or one-ton model, and 138 in. on the one-and-one-half-ton truck. The chassis weights for the two models are approximately 3000 lb. and 3500 lb.

A somewhat unusual construction is employed for the front fender and running board, these two units being combined in a one-piece stamping.

The price of the Model B-10 or one-ton chassis is $1690 f.o.b. factory, and of the B-12 or 1½-ton model $2250.

Service Announces Two New Models

The Service Motor Truck Co., of Wabash, Ind., is putting out two new models for the 1920 season. One of these, Model 31, is of 1½-ton capacity mounted on solid tires and with the governor set to permit a maximum speed of 15 m.p.h. The Model 36, known as the Farm Highway Special, is practically the same as the Model 31, except that it is fitted with a slightly larger engine and is equipped with large pneumatic tires. There are also some slight differences in the drive shaft and a higher gear ratio which permits a speed of from 20 to 25 m.p.h.



Oil Reservoirs and Wicks Keep the Spring Shackles Well Lubricated

Particular attention has been paid to chassis lubrication on both models. The spring shackles, for instance, are provided with large oil reservoirs with self feeding wicks to the different bearing surfaces. The oil wells hold sufficient oil for about two months' requirements. Refilling is accomplished through large filler openings covered by spring caps to exclude dirt.

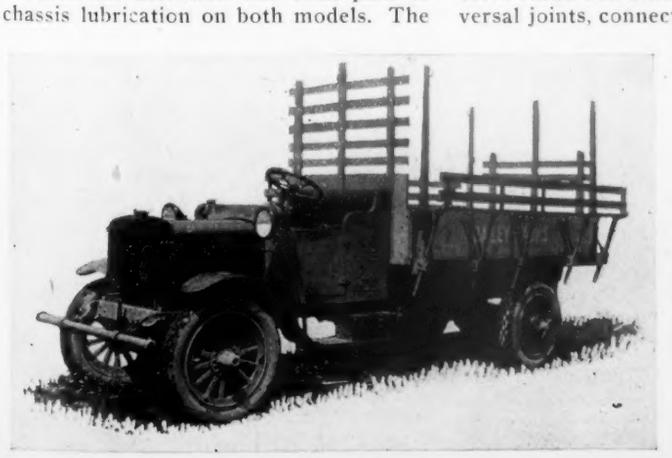
Buda four-cylinder engines are used in both models. That in the Model 31 has 4 in. bore and 5½ in. stroke, while the cylinder dimensions in Model 36 are 4¼ in. bore and 5½ in. stroke. The power plant accessories include Stromberg carburetor with hot air connection and adjusting lever on steering gear column, and Eisemann high tension magneto with hand spark control. Pump circulation is employed and the radiator is a vertical tube type with detachable core. A 20-in. belt driven fan assists the cooling system.

An enclosed 3 plate dry disc clutch is used. The transmission is a Brown-Lipe giving four forward speeds with direct on fourth. Gear reductions are 4.84 to 1 on first speed, 2.84 to 1 on second, 1.76 to 1 on third, direct on fourth, and 5.81 to 1 on reverse. A 2 in. diam. steel tube drive shaft, fitted with flexible fabric universal joints, connects the clutch with the gear set, the latter being mounted amidships. The drive shaft between the transmission and rear axle, on the Model 31, is of 1¾ in. diam. steel tubing with metal universal joints at both ends.

Timken-Detroit axles are used, the rear being of the worm drive type. Service and emergency brakes are both of the internal expanding type operating in drums on the rear wheel. Springs are semi-elliptic throughout, the front springs consisting of eight leaves each and measuring 42 in. long by 2½ in. wide. The rear springs are 54 in. long by 3 in. wide and carry 12 leaves each. The steering gear is a Ross with 20 in. hand wheel, mounted on the left side, the control levers being in the center.

Pressed steel channel sections 5 in. deep, and made of ¼ in. stock, are used for the frame side members. The wheelbase is 150 in. on both models.

Tire equipment on the Model 31 consists of 36 x 3½ in. single solid tires on the front wheels and 36 x 6 single solids on the rear. Model 36, or Farm Highway Special has 35 x 5 in. pneumatic tires on the front wheels and 38 x 7 in. on the rear. The rear axle ratio on the Model 31, or solid tire model, is 7.75 to 1 and the chassis weight 4500 lb.



The Service Model 36 Farm Highway Special, Which Has a Buda Engine. Pneumatic Tires Are Standard Equipment.

"Haul-Age" is Name of New Garford Publication

The new dealer publication of the Garford Motor Truck Co., which made its initial appearance in May, is to be known as Haul-Age. This name has been selected from scores of suggestions submitted in a prize contest outlined in the first issue.

While the new publication is devoted primarily to the interests of Garford distributors and dealers its pages contain numerous articles of timely interest to the entire automotive industry. Julian M. Chase, advertising manager of the Garford Motor Truck Co., is editor of the journal, which is published monthly.

Contracts for Motor Vehicles placed by the war department during the war and amounting in all to $416,528,000, November 11, 1918, were reduced by cancellation or completion to $17,970,000, May 17. Of the total 67 per cent. was cancelled, 29 per cent. filled and 4 per cent. still remain on order.

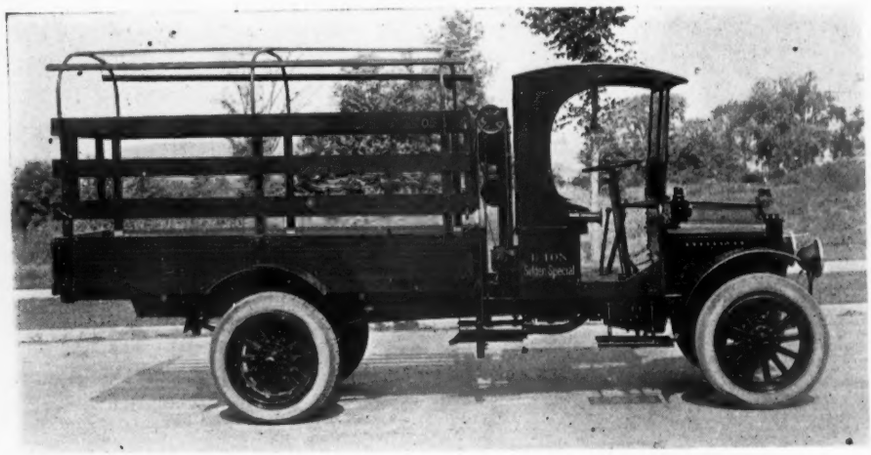
Willard Storage Battery Co., Cleveland, Ohio, has recently established the following service stations: Browne Storage Battery Co., 2201 6th St., Tuscaloosa, Ala.; Griffin Battery Service, 115 8th St., Griffin, Ga.; P. J. Turgeon, 311 West Broadway, Eagle Grove, Ia.; H. Adelman & Son, 3 Jefferson Ave., Batavia, N. Y.; Gerding Battery Service Station, Oak Harbor, Ohio; Charles A. Rice, 139 Main St., Claremont, N. H.; Independent Electric Co., 3 Sylvan St., Rutherford, N. J.; Oscar F. Lamb, 231 N. Monterey St., Gilroy, Cal.

Conner Standex Sales Co., 618 East Main St., Richmond, Va., has been made distributor of Standex products in Virginia and North Carolina.

Selden One and a Half Ton Special Truck With a Convertible Body

The Selden Truck Sales Co., Rochester, N. Y., is producing a 1½-ton truck with five-in-one body. This body can be used as a platform body; express body with 14 in. sides; stake and rack body; hand operated dump body or a covered stake and rack caravan body.

If an enclosed body is desired, bows capable of supporting a tarpaulin cover with side curtains are attached. For the transportation of perishable products, such as fruits and vegetables, racks or platforms are supplied. These racks may be arranged in tiers supported by the three horizontal stake panels.



The Selden One and a Half Tonner Has a Five-in-One Body

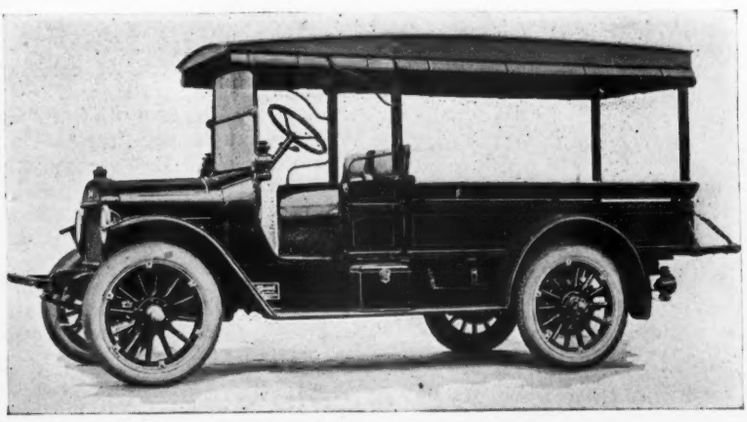
Inside dimensions of the platform body are 120 x 44 in. With the addition of two sides, 14 in. high, the body may be converted into a standard open express. A hand operated hoist, located directly behind the driver's seat, facilitates loading and unloading. If necessary, the carrying capacity can be increased by placing 4-ft. stakes in the three iron sockets on each of the sides. To the stakes are bolted three ⅞-in. stake panels or yellow pine boards running parallel with the bottom of the platform.

Specifications: Lower and side panels and stake panels are ⅞-in. yellow pine, bound and reinforced with 10-ga. guard irons; stakes are 1¾ x 2½ in. oak. Top bows are of ¾-in. iron piping held in position by three horizontal 2-in. oak strips, which support the tarpaulin cover. The body is equipped with permanent front end panel and removable tail gate.

Three-Quarter Ton Stewart Makes Its Appearance

A new Stewart truck of ¾-ton capacity fitted with any one of four different body styles, is now in production. Pneumatic tires are used and the different body styles obtainable are panel, covered express, open express and stake platform.

The engine is a four-cylinder monobloc of 3⅛ x 4½ in. bore and stroke, developing 25 hp. It is suspended at three points. A Zenith automatic carburetor is used with foot and hand throttles and dash starting adjustment. The magneto is an Eisemann high tension type with fixed spark. Cooling is by thermo syphon system, a cast tank armored radiator and 14-in. steel blade fan being used.



Stewart Three-Quarter Ton Truck With Covered Express Body. Panel, Open Express or Stake Platform Bodies Can Also be Supplied

The clutch is a multiple disc, dry plate type, and the transmission gives three forward speeds. Unit power plant construction is embodied in this design.

Two universal joints are employed on the drive shaft and the rear axle is of the internal gear type with a gear ratio of 6 to 1. All brakes are of the external contracting type, the service brakes operating on 14 in. drums on the rear wheels while the emergency brake drum is mounted in the rear of the transmission. The front axle is a drop forged I-beam section and steering gear is worm and gear type. Semi-elliptic springs are used.

The wheelbase is 110 in. Tires are pneumatic, 32 x 4 in. plain tread in front and the same size, but non-skids, on the rear. Demountable rims are used.

A front bumper, one extra rim, mechanical horn, and front and rear fenders are part of the equipment. Electric starting and lighting equipment is standard, the units consisting of a Dyneto starting motor with Bendix drive, Eisemann generator, and Willard storage battery. The headlights are fitted with dimmers and in addition there are two oil side lights and a combination oil and electric tail light giving a complete double lighting system.

The manufacturer of this new truck is the Stewart Motor Corp., Buffalo, N. Y.

Design New Truck Bodies

Engineers of the Packard Motor Car Co. and the H. H. Babcock Co., Watertown, N. Y., have designed a series of patented bodies to be used exclusively on Packard trucks. The bodies conform with the Packard standards and their special steel-reinforced construction insures safety against overloading, yet eliminating all superfluous body weight.

American Sleeve-Valve Motor Co., New York City, announces that it has completed all dies, jigs and tool equipment for manufacturing motors in quantity and has in process of manufacture 4-cylinder, 4-in. bore, 5-in. stroke motors. The company is negotiating for the purchase of a well-equipped engine plant, with a capacity of about 10,000 motors per year. C. P. Hollister, chief engineer and designer, has recently been elected vice-president of the company.

Beaver Motor Truck Co., Hamilton, Ont., has recently been incorporated by J. Hogue, R. Williams and Oswald Sturdy, and will shortly place a two-ton truck on the market.

Correction

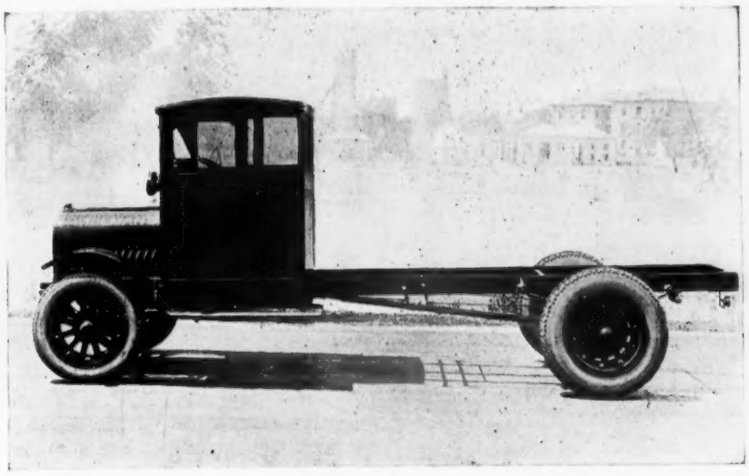
On page 56 of the July issue of the COMMERCIAL CAR JOURNAL cuts of the Standard truck, made by the Standard Motor Truck Co., Detroit, and the Old Hickory truck, made by the Kentucky Wagon Works, Louisville, Ky., were inadvertently transposed.

Six-Cylinder Continental Engine in the New Kankakee

PNEUMATIC tires and 6-cylinder Continental type 9N engine are the outstanding features of the new Kankakee 2½-ton truck manufactured by the Kankakee Automobile Co., Kankakee, Ill.

The engine, which is of 3½-in. bore and 5¼ in. stroke is carried on 3-point drive rear axle. The front axle is a Shuler product and the steering gear is made by the Ross Gear & Tool Co.

The frame of this truck is somewhat unusual, being made of rolled steel channel section (that is, structural steel). The side members are straight and six cross members are employed. A ball bearing



New Kankakee Two and a Half Tonner, Which is Powered by a Six-Cylinder Engine

suspension, the front bearing being mounted in a bracket below the second cross member of the frame, making practically a straight line construction. Delco ignition is used and standard equipment includes generator and electric starting motor, also of Delco make.

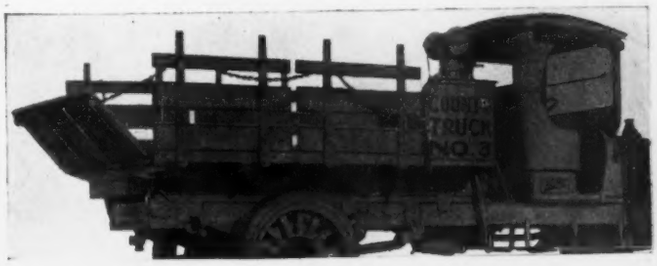
The carburetor is a Zenith fitted with a hot air duct. A Muncie transmission is used and drive is through one solid and one tubular steel shaft with 3 universal joints to a Russell internal gear bracket on one of the central cross members carries the rear end of the horizontal drive shaft. It is claimed that the rolled steel channel type frame has shown a superiority to the pressed steel type in severe tests.

The wheelbase of this model is 170 in. 36 x 6-in. pneumatic tires are used on the front wheels and 40 x 8 in. pneumatics on the rear. The list price of this model is $2475.

The Acme Line of Truck Bodies

THE body building equipment of the Acme Motor Truck Co., of Cadillac, Mich., builder of the Acme truck, includes facilities for making many kinds of bodies, ice, lumber, furniture, etc., but there is probably more attention given to the Standard and special Express, Standard Stake, Standard Dump and combination Dump and Stake Bodies than to any of the others.

Acme Three and a Half Ton Chassis Equipped With Combination Dump and Stake Body, Showing Stake Sections in Place.





Acme Two-ton Chassis Equipped With Special Express Body, Made in Acme Factory

Special attention is paid to the lumber used in the construction of Acme wood bodies. Only first quality oak or hard maple is used. This lumber is carefully selected and seasoned. The pieces are then machined, sanded and oiled, so that the wood will not take up moisture while the body is in the process of construction.

The Acme Stake body platform is made of heavy material, thoroughly bolted. The entire platform is surrounded by an angle iron frame riveted together at the corners, making it really one continuous band of steel, so this platform will stand the gaff of hard knocks. To this angle are riveted the stake pockets and to the stake pockets is riveted an outside skid iron across the rear and on each side, making unloading very convenient. Stake sections and battlements are of oak.

Acme Combination Dump and Stake Body

This body has been especially designed to combine advantages of an all-steel dump body with those of the Acme Standard Stake, having dump and stake body sides interchangeable. The dump body sides and the stationary battlements, which support the lifting arms, are constructed of extra heavy rolled steel, reinforced with angles. The battlements, 24 in. high and 30 in. long, unite with the dump body sides in forming an inside body compartment that can be dumped clean in 20 seconds. When not in use as a dump body, the steel sides and steel tail gates are removable, and side stake racks, 36 in. high, furnished as regular equipment, substituted in their place, as well as a stake body tail gate which hinges at the bottom. An 18-in. and 24-in. wood reinforced tail gate, when lowered, extends platform length to a practical 10, 12 and 13-ft. stake body in the 2, 3½ and 5-tonners.

Acme Standard Steel Dump Bodies

These all-steel dump bodies are also built in the Acme factory and equipped with the Wood hydraulic hoist. On 2-ton bodies 12-gauge steel is used and on 3½ and 5-ton bodies, 10-gauge steel.

Special care is given to proper cross-member design to substantially support the platform of the body. All steel body parts are built to a templet. The corners of all steel bodies are properly gusseted and welded to prevent failure at the corners.

A special Acme design of tail gate latch has been worked out which can be operated by the driver from the seat. Road building trucks are equipped with an adjustable latch to permit gravel, crushed rock or other material to be



Acme Three and a Half Ton Chassis Equipped With Combination Dump and Stake Body, Showing Dump Sections in Place

evenly spread by the truck as it moves along.

The construction of the Acme Express body and the special Express bodies provides greater loading space than if express body were set between wheels.

The special Express is built on the Acme stake body platform. The express sides and front and tail gate are removable, but when in position are rigid, being held in position by ironed stakes, which fit snugly in the stake pockets.

The combination stake and express body is also a special job, being similar to the standard stake body mentioned previously. This makes a very practical, general utility body.

The standard painting on Acme bodies is royal blue striped with a wide black line and a narrow white line.

Army Trucks Being Equipped With Hoists and Dump Bodies

The Wood Hydraulic Hoist & Body Co. has contracted with the highway bureaus of the States of Illinois and Wisconsin to equip all United States Army motor truck chassis, for highway improvement for these states, with Wood hydraulic hoist and steel dump bodies.

A building on the corner of East Thirty-third St. and Graves Ct., Chicago, has been leased and a machine and tool equipment installed sufficient to warrant expedition in fulfilling a contract for haulage equipment, which for magnitude, is unparalleled in the annals of highway construction. The plant is a one-story structure, covering an area of 150 x 150 ft. A shop force of twenty mechanics is placing in commission ten completely equipped motor trucks daily. The trucks are promptly forwarded, over the highways and under their own power, as the contracting states direct, to designated points where highway construction is either in progress or prospective.

The State of Wisconsin is doing its own work. F. H. Little, who is in charge of the Illinois state highway construction motor trucks, now has "on the job" seventy-seven 3- and 3½-ton capacity and fifty of 2-tons capacity on the Lincoln and Dixie Highways. Illinois will employ a grand total of between 800 and 900 motor trucks under this contract.

The chassis models Uncle Sam supplies include Nash Quads, 2-ton; Standard, 3½-ton, and Heavy Aviation, 3-ton; the latter type built by the Kelly-Springfield Motor Truck Co. and the Velie Motors Corp. during the war.



Federal Truck for Ice-Cream Delivery

The Bendfelt Ice-Cream Company of Milwaukee operates two two-ton Federals with bodies well adapted for ice-cream delivery. Three compartments, metal lined, are provided for ice or containers and another for salt. Partitions can be set in in order to facilitate the handling of brick ice-cream or regular freezers. Space is left in the center of the body, which enables the driver to unload with ease. Drain pipes lead from each compartment and these carry all water well below all the truck parts, so that there is no damage done to the springs, frame or other parts under the body.

Motor Car Shipments for the Month of June Amounted to 23,580 Carloads

NEW YORK, July 18.—At the meeting of the directors of the National Automobile Chamber of Commerce at Buffalo, July 16, the Traffic Committee, consisting of W. E. Metzger, A. I. Philp, F. C. Chandler and J. S. Marvin, manager, reported that 23,580 carloads of motor vehicles were shipped in the month of June compared with 15,869 for the month of June, 1918.

The Traffic Department has notified members of this organization that it is advisable to protect claims covering loss and damage items by filing suits against carriers within two years and one day of the delivery of shipments. These claims in some cases are a long time in settlement and some railroad attorneys have ruled that the carrier is not legally liable after two years and one day, owing to a clause in the bill of lading requiring that suits be filed within that time. The members have also been notified fully on the procedure to be followed in collecting claims against the Adams Express Co. on shipments prior to July 1, 1918.

A reduction in freight rates on motor cars in carloads from Eastern points to Pacific Coast ports for export has been arranged and took effect July 10. Freight machines will have a rating of $2.75 per 100 lb. compared with previous rate, $3.25.

The department has also arranged for a rating of 15 per cent. below second class on motor trucks complete, K. D., in boxes or crates, carloads in Eastern territory. Heretofore this rating has been second class.

Truck Exchange for St. Louis

ST. LOUIS, MO., July 15.—A Rebuilt Truck Exchange has been proposed to the Commercial Car Bureau of the St. Louis Automobile Manufacturers' and Dealers' Association by H. C. Bailey, of the St. Louis Branch of the International Mack Corp. The suggested plan is similar to that of the Metropolitan Motor Truck Exchange of New York. Mr. Bailey has been made chairman of the committee appointed to formulate the plans for the exchange. Others of the committee are B. E. Purcell, of the Dorris Motor Car Co.; H. H. Hawke, of the Traffic Truck Corp.; Henry Rottersman, of the Rottersman Auto & Truck Corp., and Frank Martin, of the Martin Truck

Good roads mean prosperity for America

Monument Builder Finds Truck a Time and Money Saver

By C. P. SHATTUCK

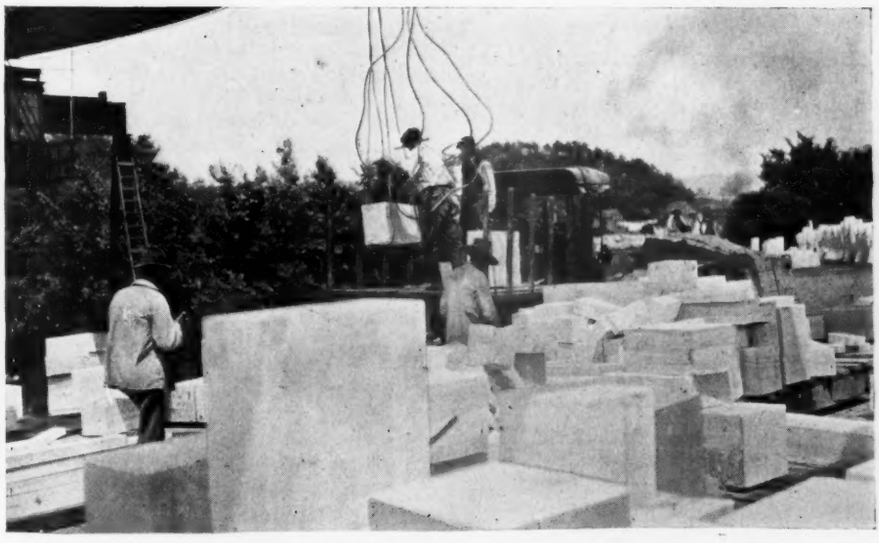
ONE of the direct results of the freight embargoes of the war has been the successful use of motor trucks in certain industries that heretofore have relied upon the common carriers to transport their products. Through long and constant use of the railroads, the older and more conservative concerns have been exceedingly difficult prospects for the truck salesmen. Some of these companies were practically forced to use highway transportation during the war and in almost every instance they have been converted to the truck through its economy and greater utility.

The experience of Kinsman & Mills, monumental workers, of Rutland, Va., is an example. This is an old concern that maintains a plant for finishing marble and granite for monumental purposes. It obtains its marble supply from the quarries and supply yards in Center Rutland and West Rutland, one and six miles respectively from Rutland. The marble, after being quarried, is cut into slabs and blocks of varying size and weight.

The marble slabs and blocks were, in the past, hauled by horses, and granite, which comes from Barre, the great granite center of Vermont, was shipped by freight. In the case of large pieces of monumental work of granite the material was shipped by freight to the city for which it was destined and horses were used to haul it to the plant or to the cemetery.



Unloading the Truck at the Plant of Kinsman & Mills
The blocks of marble in the foreground afford some idea of the material hauled by the truck



At the Yard of the Vermont Marble Company
The blocks of marble are picked up by traveling crane and deposited on the truck in exactly the position required

Kinsman & Mills' trade is not confined alone to the immediate vicinity of Rutland. Its monuments, markers, etc., are being used in cemeteries as far distant as Providence, R. I. and Utica, Syracuse, Troy and Auburn, N. Y.

The bulk of the trade is with the following places, whose distances from Rutland are also given to show the extent of the territory now served by the truck: Vergennes, 46 miles; Bristol, 45 miles; Ticonderoga, 46 miles; Troy, 86 miles; Woodstock, 30 miles; Hudson Falls, 50 miles; Springfield, Mass., 125 miles. Formerly the finished work was shipped by freight to these points.

Kinsman & Mills convert the rough slabs of marble or granite into polished, artistic designs which, when shipped by the common carriers, require careful crating. In the case of monuments there may be four separate sections, including the base or foundation, and all must be carefully crated to avoid the possibility of injury in handling and in transit. This expense is considerable.

After crating the marble was hauled to the freight yard by horses and loaded on flat cars. All work is set up by Kinsman & Mills, even at great distances, and the practice was to send the head man or setter-up with a crew of men to the city and cemetery. Whenever the work was shipped to points as far distant as Providence, R. I., the head man hired workmen, as well as the tools and tackle, in the city. Teams were also engaged to haul the monuments from the freight yard to the cemetery, and invariably, with the larger pieces of work, the horses made from three to five trips. As the cemeteries are generally on the outskirts of the city and some distance from the freight yard, the haulage costs were considerable.

Dealer Analyzes Hauls

These were the conditions existing during the days of freight embargoes and when Mr. Coolidge, of the Rutland Machine & Automobile Co., Rutland, Vt., agent for the Selden line of trucks, analyzed the transportation methods of Kinsman & Mills, the Selden agent saw that, by using a 2-ton Selden truck, the use of the common carriers could be dispensed with on hauls within the economic capabilities of the truck, and furthermore, the truck could effect a big saving on hauls to the places previously named.

It is admitted that the fact that embargoes existed sold the truck. Mr.

Mills is very frank in stating this. He admits that it has done all that Mr. Coolidge claimed it would and more, that it is saving a considerable sum when compared to the former expense with horses and common carriers, and that the delays contingent on the use of the railroads are now avoided.

A concrete example of the economy and utility of the truck is an average haul to Vergennes, 46 miles from Rutland. Under the old conditions the four pieces of work, monument and base, would cost $32 to crate, haul to freight yard, load and ship to the nearest point to the cemetery at Vergennes. The setting-up man would take two helpers and the fare for three men, round trip, would be $9. It would cost $35 to haul the four sections from the freight yard at Vergennes to the cemetery, as four round trips of three miles are necessary. Under normal conditions it would take two days to complete the work. And the cost would be about $76; that is, the estimated cost at the present cost of railroad fares, labor and horses. No estimate is made of food for the men.

The Selden truck has made possible the completion of the work in a day and at considerably less expense. On identically the same character of work the truck left Rutland at five in the morning, carrying two men and the tools and tackle. It reached Vergennes at 8.30, made four round trips between the freight station and the cemetery (three miles to the round trip) the foundation was laid, monument erected, and the truck was back in Rutland at eight in the evening.

Costs Compared

The truck consumed, according to the setting-up man who drives it, 16 gals. of gasoline, at 28 cents the gal., and 1½ gal. of oil at 90 cents the gal., or a total of $5.83 for fuel and oil. Unfortunately operating costs are not maintained, although depreciation is charged at 20 per cent. the year and insurance carried. As near as the writer could ascertain the truck is costing considerably less than $15 a day. There is no charge for garage, the truck being housed on the premises. Assuming that $15 a day is a fair charge, the truck is effecting a saving in hauls similar to that cited of over $50, plus the prompt service afforded customers, and the writer was informed that persons purchasing monuments, markers, etc., are as keen for prompt delivery of work as in other lines.

Roads Severe on Mechanism

The truck is used for hauling marble from Center and West Rutland and operates over roads and grades that impose unusual stresses upon its units. The roads leading to the quarries are very uneven, full of deep holes. These conditions explain the unusually large number of nuts and bolts charged up in the repair bills of the truck. Since May, 1918, the repair and supply bills have amounted to $49.80. Of this amount, $6 was for spark plugs, $2.53 for radiator work and $4.03 for attention to the carburetor. The nut and bolt bill referred to was $6.25, which indicates the character of the roads, and, possibly, the failure of the driver to keep the nuts tight. In actual repairs the truck has cost $30.99, which was for the transmission. The change speed mechanism certainly does see hard service in some sections of Vermont, so much so that it is well worth a separate article.

Truck Gets Men Home on Same Day

On practically every haul the truck is effecting a big saving to its owners. It has eliminated much lost time over the former method, where big work frequently required two weeks from the time crating began until the work was set up. The truck has also eliminated the need of crating, quite an expense. The company maintains one team in and around the plant for short haul work. The ability to complete work in the same day is a factor that appeals to the workmen, who, like all New Englanders in the smaller places, have their own homes and are not keen to spend evenings away from them. With the possibility of getting home the same night the men do not waste any time. The use of the Selden truck in the case of Kinsman & Mills affords one of many instances of the benefits of the war and freight embargoes.

Goodyear Truck Has 82,000 Miles to Its Credit

NEW ORLEANS, LA., Aug. 6.—A mud-bespattered three-ton truck belonging to the Goodyear Rubber Co., of Akron, Ohio, finished the 82,000th mile of its nation-wide demonstrating tour July 29, when it rolled into New Orleans. This truck is one of a fleet of ten which has been in service between Akron and Boston, hauling freight in demonstration of the ship-by-truck idea. After making several trips over this route, this truck was driven from Boston to San Francisco and Los Angeles and return, and has been in service some eighteen months, though apparently as ready for a short or a long haul as when it was first put into service.

On the present trip the truck left Akron, going through Cincinnati, Louisville, Nashville, Atlanta, Jacksonville, Miami, Tampa, Montgomery, Mobile, and thence to New Orleans by way of Hattiesburg, Miss., and Baton Rouge, La. Harry Apple and M. K. Farrington, demonstrators for the Goodyear factory, drove the truck from Atlanta to New Orleans. Mr. Farrington said:

"This is my first trip through the South, but I shall always think of Dixie as the country of nicest people and the worst roads in the world. The highways out of Atlanta are good, as are those in Florida, but the roads in Mississippi are very bad, only about 20 per cent. of the mileage being graveled, and Alabama is about as bad as Mississippi. But the Louisiana roads we traveled were the worst of any we encountered, especially that link between Donaldsonville and New Orleans, which is nothing but a bog. Between Raceland and Thibodaux we passed four United States army trucks, which had slipped off the road into the ditch. After we had pulled all four of them back into the road, one of the drivers told me that, though he had seen service overseas, none of the roads of Flanders in the rainy season were as bad as these gumbo-mud roads of southern Louisiana.

"Our truck averaged 20 miles an hour between Boston and Akron, but we averaged only two miles an hour between Mobile and New Orleans, notwithstanding we had a fairly good surfaced road between Mobile and Hattiesburg, Miss. While Florida has good roads, the majority of the bridges in that part of the state through which we traveled were poorly constructed and frail. Crossing Indian River we regretted venturing out on the bridge, but were afraid to stop for fear that the truck would break through. I have often since wondered how we ever were lucky enough to get over that bridge without a wreck. Many of the small streams in Louisiana have no bridges at all, and we forded many a stream on the way to New Orleans. In fact, there were only two bridges on the whole stretch of road from Columbia, Miss., to Baton Rouge, La. The large structures over the bayous between Baton Rouge and New Orleans were all right, but the bridges over the small streams were anything but safe for heavy traffic. We made the trip from Atlanta to New Orleans on one set of pneumatic tires, 44 x 10 rough tread in rear and 38 x 7 rib tread in front."

Clark Lubrication Sheet.—Most of the trouble which develops after a truck has seen only slight service, can be traced to the operator and is usually the result of a lack of proper knowledge and care on the driver's part. It is with the idea of reducing this trouble to the minimum that the Clark Equipment Company, of Buchanan, Mich., manufacturers of Clark internal gear drive axles for motor trucks, has prepared for every user of the Clark axle, a phantom drawing showing places and number of miles between oilings. This drawing graphically illustrates the mechanism of the axle and the lubrication chart is tinted to show the quantity of oil and grease to be kept in chambers and bearings.

The Clark Co. will mail to every user of a Clark axle a copy of this drawing, together with lubrication chart and instruction sheet regarding care and oiling. Address the plant at Buchanan, Mich.

Owen Tire & Rubber Co. has just opened a new restaurant for employees at the factory at Bedford, Ohio. It is built on the roof of the plant, making its surroundings exceptionally clean and healthful.

It seats comfortably one hundred people and serves meals in relays from 11.30 A. M. to 2.30 P. M., in order to accommodate all of the employees.

Grocery Concern Finds Trucks Profitable on Short Hauls

Produce Company Utilizes Trucks to Haul Fruit to Market. Salesmen Use Passenger Cars in Covering Their Territories

By C. S. PERRIE

"WE do not consider the costs of our trucks but the service afforded by the trucks to our trade," said T. B. Hanna, of the Burlington Grocery Co., Burlington, Vt., wholesale grocers, when asked if he found motor trucks profitable on short hauls. "Horses today," continued Mr. Hanna, "would doubtless cost us as much as do our trucks, but we would not return to horses even if cost figures showed them to be more economical than the automobiles.

"In these days of keen competition the prompt filling of orders is a factor in merchandising and the trade expects a grocery company to be able to supply emergency orders. We can not dispense with our trucks; two years' service has also shown that the trucks have an advertising value. Besides, we are obliged to use trucks, for our competitors employ them."

The Burlington Grocery company has had two years' experience with its 2-ton Seldens which are employed for local delivery to the retail stores and cover a radius of from five to eight miles. The machines are also used to haul groceries to the railroad. The company has an extensive out of town trade and its traveling salesmen cover a large territory. The trucks are employed only for delivery purposes since the supplies are brought to the storehouse by a spur track of the railroad, leading to the warehouse.

Low Percentage of Cost

Transportation conditions in Burlington are not unlike those of other cities in Vermont, in that the use of commercial cars is confined to what may be termed local work, to delivering merchandise in the city and towns that are practically suburbs of the city. As a rule the radius of delivery is about eight miles, although one or two companies are experimenting with longer hauls. Severe grades and none too good roads are factors responsible for confining the operation of trucks to practically city work.

Among the several instances of the satisfactory use of trucks on short hauls in this section are Reo 1500 lb. capacity machines in service with the Champlain Valley Fruit Co., Burlington, Vt. This company is probably the largest in the Champlain Valley, supplying retailers within a radius of 75 miles, and maintaining a corps of traveling salesmen. The salesmen do not use the railroads, but passenger automobiles.

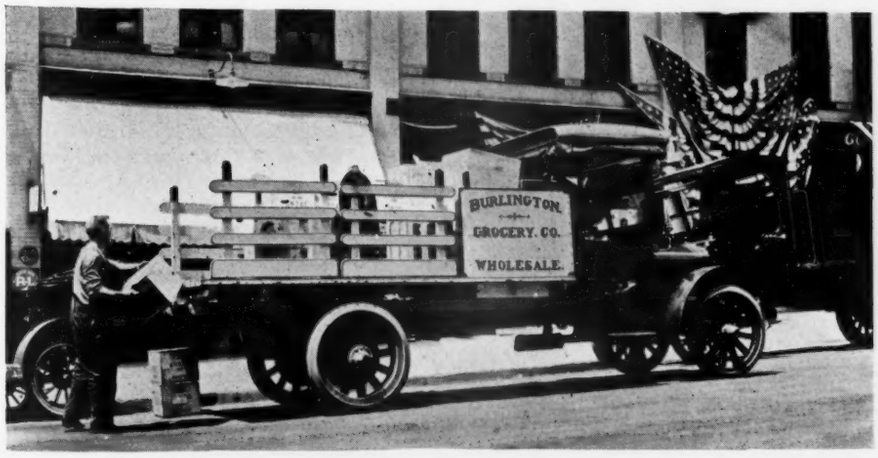
Like the Burlington Grocery Co. the radius of delivery is about eight miles, which includes the town of Winooski, a mill town. The fruit is brought to the platform of the Champlain Valley Fruit Co. by rail and transferred across the platform to the shipping room, thence loaded into the trucks.

Several years' experience has convinced the company of the economy of the truck, for the perishables are delivered to the trade in a much better condition and a larger volume can be delivered much more quickly than with horses, which were formerly used. This is particularly true during the rush hours in the early morning and when the common carriers are late in their deliveries at the platform.

Total costs, not detailed figures, are kept of the Reos, and the No. 1 machine's total cost for the year was $907.81. One-third of the cost of the truck, $1545, is charged off the first year. The policy provides for charging off $300 the second year and $100 for repairs and a like sum for tires. The sum of $200 is charged off the third year and $200 for the overhaul. It is figured that the truck will have a market value of $500 at the end of the third year, although the local representative said that this was a low figure. No charge is made for interest on the investment or for garaging, the cars being stored on the premises. The insurance is $114.20 for the two trucks. Mileages of the cars were not obtainable, as the writer was informed that although an effort had been made to keep a record the speedometers were reported "out of order" by the drivers.



The Champlain Valley Fruit Company, Burlington, Vermont, Employs Reos for Delivery of Fruit and Passenger Cars for Its Salesmen, and Both Have Proven Profitable



The Two-Ton Selden Successfully Used on Short-Haul Work by the Burlington Grocery Company, Burlington, Vermont

The service rendered by the trucks is considered an asset. The company also has found that the volume of business has been greatly increased by the salesmen using automobiles. Not only do they cover considerably more territory than formerly when using the railroads, but the men have more time to spend with the customers, and the New England merchant, especially in the small towns, appreciates having the salesmen "visit" a little. The automobiles have likewise facilitated collections. During the winter when the roads in the country are not passable, the collections fall off, but pick up with the resumption of the use of the cars. The total cost of the trucks and passenger cars is one and one-half per cent. of the total costs, a very low figure.

Ice-Cream Manufacturer Utilizes Trailer to Great Advantage

THE Arctic Ice Cream Co. purchased its first semi-trailer from the Fruehauf Trailer Co. of Detroit four years ago. The transportation unit gave such satisfactory service that three months later seven additional Fruehauf Trailers were bought. Early this spring two more Fruehauf Trailers were placed in service and the company is now operating ten trailer-truck units, all of four and six tons capacity.

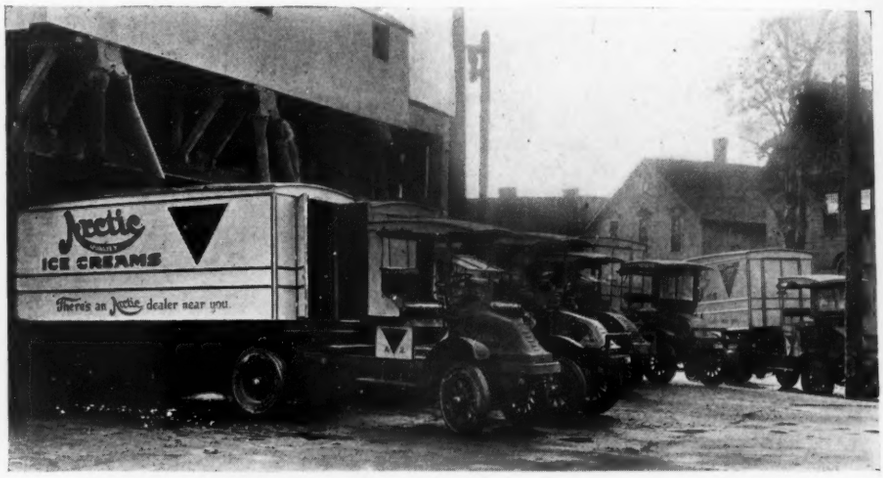
The trailers are operated in connection with 1½-ton Kelly-Springfield trucks and are designed especially for transportation of ice cream.

The bodies are full paneled and sheeted inside, allowing for a three-inch air space to act as an insulator. The forward end is separated from the rest of the body by a partition and is accessible through doors in the front. This compartment is used as a container for the refrigerators, carrying brick cream and specials, and serves as a receptacle for empty cans. The water tight flooring slopes toward the center and to the rear, thus allowing for drainage of the salty water and to keep it from coming in contact with the mechanical parts of the trailer or tractor. These parts are in this way protected against the corrosive action of the brine.

After cans of ice cream are placed in tiers in a trailer, a trap door in the roof of the trailer is opened and pulverized ice and salt enters the trailer body through spouts by gravity action. The force is sufficient to pack the ice around the cans.

The trailer-truck unit then starts out on its trip to stores on its route, which is so arranged that the last can of ice cream is delivered only a short distance from the Arctic company's plant and the trailer-truck can then be filled with another load of ice cream. The loading operation requires but a short time and the units are kept in operation almost continually.

This company states that the operation of Fruehauf Trailers in connection with 1½-ton trucks has enabled the Arctic Co. to reduce its investment in transportation equipment thousands of dollars.



Part of the Installation of the Arctic Ice-Cream Company
The chutes for delivering pulverized ice to the compartments of the trailer body are here seen



The Fruehauf Trailer Unit, on Which is Mounted a Specially-Designed Ice-Cream Body
The trailer is mounted on Sewell cushion wheels

George W. Copp Co., Inc., New York City, announces the opening of a showroom at 54th St. and Eleventh Ave., for the display of Anchor glass enclosed demountable tops, taxicab or limousine bodies for the Ford chassis and complete automobile top and body equipment. George W. Copp is president and general manager of the company, and S. E. Barringer, sales manager.

Ironclad-Exide Battery.—Electric Storage Battery Co., Philadelphia. Pa. This booklet is descriptive of the Ironclad-Exide battery, and gives a sketch of its development. The booklet has been revised and brought up to date, and is now ready for distribution. It may be had upon application to the Electric Storage Battery Co., Allegheny Ave. and 19th St., Philadelphia, Pa.

Essenkay Products Co., Chicago, Ill., announces the opening of a branch at 3021-23 S. Michigan Ave. The new branch on Motor Row will be a central city sales depot and installing station. The main service station at the factory, Superior and Franklin Sts., will be continued.

NEXT ISSUE:
"Winter Equipment Number"

LEGAL DEPARTMENT



Liability Concerning Leased Vehicles

When possession of a motor vehicle is delivered to another, under a contract of hiring, what is the measure of the borrower's liability? If the machine should happen to be stolen, destroyed or injured while in the borrower's custody could he be held liable to the leasing owner for the loss?

These practical questions find answers in general principles of law which became firmly settled long before the motor vehicle was more than dreamed of. The principles constitute part of the law of what is termed by the legal profession "the law of bailments."

But few laymen, who own and lease motor trucks to others, know that the legal name for such a lessor is "bailor," that the borrower is the "bailee," and the lease transaction a "bailment."

A bailment will include almost any sort of a transaction under which personal property of one person is entrusted temporarily to the care of another. Hence, there is a bailment whenever a motor truck comes into the possession of another whether for the purpose of use or the making of repairs by the bailee.

The general test of liability of a bailee for the safekeeping and safe return of the property may be very briefly stated. It is the exercise of that degree of care which an ordinarily prudent person would use under the same circumstances. In other words, the borrower of a motor vehicle is not an insurer that it will be returned to the owner in an undamaged condition, or that it will be returned at all, excepting as there may be a special agreement embodying such guaranty. All that the borrower impliedly agrees to do is to take as good care of the vehicle as an ordinarily prudent man would take of his own property.

But this important qualification must be added to what has been said above: The borrower must make no unauthorized use of the vehicle. If he hires a truck for one purpose and uses it for another he may become liable for loss or injury resulting from the unauthorized use, although not through negligence.

The first important suggestion we have to make is that, if the lender of a motor truck or other chattel desires to impose special liability on the borrower, he should be careful to see that it is specifically covered in the hiring agreement.

"Agreements by a bailee that he will pay the value of the property if damaged or destroyed while in his possession, that he will assume responsibility for its loss from any cause, or that the property is to be at his risk against loss by fire or otherwise until returned, are sufficient to render him liable as an insurer. And it has been held in some cases that a similar liability is imposed by an agreement to return the property in good condition, or as it was at the time of hiring; but, by the weight of authority, such an agreement does not make the bailee liable for injury to the property occurring without his fault. And in like manner, it has been held that an agreement by the bailee to keep or to carry goods safely, to 'be responsible' for them, to 'sell or return' them, or 'deliver' them does not render him liable for an injury to the goods while in his possession, but occurring without his fault." 6 Corpus Juris, 1111, 1112.

Just as the bailee's responsibility can be enlarged by special agreement it may be diminished in the same way, provided that the agreement contains no provision violative of law or good conscience. But it seems to be well settled that a contract purporting to relieve a bailee from liability for loss or injury to the property occurring through his fault or negligence is invalid, since the law frowns on a contract which purports to leave it open to one of the parties to do any act that is wrongful or negligent without liability therefor.

It remains to elaborate the general principles above stated enough to show their practical application to lease of motor trucks, etc.

Should a truck be leased for the limited purpose of transporting goods about the streets of a city, and should the lessee use it, without the owner's knowledge or consent, to haul goods to other towns there would be such unauthorized use as would make the lessee absolutely liable for any loss or injury to the machine arising in the course of such unauthorized use, however carefully the machine may have been driven. The same rule applies that governs the case where a motor vehicle is entrusted for storage only and the custodian for that purpose uses it for his own benefit.

If a truck be hired for particular use —say, hauling heavy materials—and is found to be so far unsuited to that use as to imperil the safety of the machine it would be actionable negligence for the borrower to continue to use it. So, too, negligence on the part of the borrower may exist in continuing to use a car after it needs repairs. If it is the lessor's duty to make such repairs he should be notified of their need before further use of the car is made.

In passing, it would be interesting to read the following summary of what the courts of the country have decided on the question as to who bears the duty of making needed repairs:

"While the authorities are comparatively few in number, the general rule appears to be settled that, in the absence of statute or express contract, a bailor (the owner) is responsible for extraordinary repairs which inure to his benefit, and which were not caused through fault or neglect of the bailee; and the bailee must bear the expense of repairs which are ordinary and incidental to the use of the thing bailed." 6 Corpus Juris, 1113.

In other words, should the gears of a truck be all but worn out when delivered to the lessee and he be compelled to replace them, the lessor should bear the expense, excepting as there may have been a mutual agreement to the contrary. But repairs rendered necessary and solely or mainly by the lessee's use of the truck should be borne by him, in the absence of agreement to the contrary.

The above quoted legal authority adds:

"Further, where it is customary for the bailor to put the article bailed into condition for use at the time of the bailment, he is liable for expenditures by the bailee required to place it in such condition where he himself has neglected to do so. However, the question of whether the bailee is bound to pay the ordinary expenses incident to keeping the article hired in a state of repair is controlled largely by the rate and nature of the recompense, by custom and usage, and by the character of the article."

It goes without saying that the borrower is liable for the cost of all repairs rendered necessary through his fault in making negligent or unauthorized use of the vehicle.

An application of the general rule, stated at the commencement of this article, that, except as modified by special agreement, the borrower's responsibility depends upon his having failed to use that degree of care which an ordinarily prudent person would have used in the circumstances, necessarily means that the borrower is not liable for loss or damage resulting from fire or theft or collision unless he has been guilty of fault or negligence. If a fire was not caused by his fault, he is not liable for burning of the vehicle, excepting as he may have been negligent in some way in failing to remove the vehicle from an imperiled place after the fire was discovered. If the borrower takes all those precautions to guard against theft that would be taken by a man of ordinary prudence under the same circumstances he is not liable for loss of the vehicle by theft. The

vehicle might be demolished in a collision on a street or road without imposing liability against the borrower; the point turning upon whether the driver was negligent.

Of course, in determining whether the borrower has been negligent, any negligence of his employees while using the borrowed property under the direction or sanction of the borrower is, in the eyes of the law, his carelessness.

In closing, it is important to note that, as a general rule, when suit is brought to charge a borrower of property with liability for loss or injury to it the lessor makes out a prima facie case entitling him to recover by showing that the borrowed thing was delivered to the borrower in good condition and was returned in a damaged condition, with proof as to the extent of the damage in dollars and cents. It then develops upon the borrower to clear himself of responsibility by affirmatively showing that the particular loss or injury was not due to his fault.

Garageman's Duty as to Stored Trucks

What is the measure of a garageman's legal duty in the matter of taking precautions to avoid injury to a customer's truck or automobile on account of freezing or other similar conditions?

This question is answered by the same fundamental principle of law that governs the liability of any person who has any personal property belonging to any other person in his custody—the principle that, except as the duty may be enlarged or diminished by special agreement, such custodian must use that degree of care that is reasonably to be expected of an ordinarily prudent person under the same circumstances.

The point is well illustrated by a decision recently handed down by the Appellate Term of the New York Supreme Court in the case of Louis H. Smith vs. Economical Garage, 176 New York Supplement, 479.

Smith sued to recover damages for injury, through bursting of the water jacket on the engine of his car, due to freezing of water in the cooling system while the machine was in live storage in defendant's garage. It seems that the car was in good condition when plaintiff returned it to the garage December 30, but that it was found to have been injured in the respect above mentioned when he called for it January 1.

Trial of the suit resulted in a judgment in defendant's favor, but the Appellate Term has reversed the decision on the ground that defendant failed to prove that the injury occurred despite exercise of due care on its part.

The decision on appeal starts out with the proposition that where a motor vehicle is proved to have been left at a garage in good condition and to have been returned to the customer damaged, a presumption of negligence on the part of the garagekeeper arises. In other words, the customer does not assume the burden of affirmatively showing just what negligence on the part of the garagekeeper resulted in the injury; the burden is on the latter to exculpate himself.

The evidence in this case showed that, although the garage was steam-heated, extremely cold weather brought about a freezing temperature in the place. It was also shown that defendant took precautions as to some cars stored in its garage by keeping the engines running, and, as to others, by draining the water from the radiators. But nothing was done to avoid freezing of the water in plaintiff's car. The defendant sought to excuse this omission by saying that it was entitled to assume that plaintiff had some antifreeze solution in the radiator, that he had not authorized the garage to drain the water, and that he had taken the key to the ignition system with him.

Holding that defendant had failed to discharge the burden of proving that it had used due care for the safekeeping of the machine, the Appellate Term says:

"When the plaintiff stored his car in a steam-heated garage, he had a right to at least expect that the temperature would be above the freezing point. If, owing to the severity of the weather, the defendant could not keep the temperature above the freezing point, although he had done everything that an ordinarily prudent man could do to keep up the temperature, still the defendant would not be relieved from the obvious precaution of either drawing off the water from the cooling system, or taking other obvious precautions to prevent the water from freezing and bursting the radiator. The fact that the plaintiff had taken with him the key to the ignition system might have some bearing on whether the defendant should have sought to have prevented the freezing by the expedient of running the motor, but would not have excused his neglecting the other **obvious precautions that any ordinarily prudent person would have exercised in the care of like property of his own.**"

The words we have emphasized above state the cardinal test of liability in all ordinary cases where motor vehicles are left in the custody of another for repair, storage, etc., excepting, of course, where there is a special contract fixing a different measure of care.

But this point of duty to use care for the safety of another's property is qualified and materially affected by the circumstances of each particular case. For instance, although a garageman might well be held to be negligent in failing to drain water from the radiator in the case of a car left in a cold garage on a winter night, it would not follow that he would be liable for freezing occurring at an unusual or unprecedented time.

The law's requirement for the exercise of reasonable care in the handling of another's property may be applied to numerous aspects of the commercial car. For example, in the absence of special contract to the contrary, a garageman's liability for loss of a customer's truck depends upon the loss being traced directly to the garageman's failure to exercise that degree of care to avoid the loss that any ordinarily prudent man would have used under the same circumstances.

So, too, liability for thefts is to be tested by the question of fact whether average care has been used in the particular instance. Should it appear that a garage has been left unattended and unlocked under such circumstances that loss by larceny might have been contemplated, the keeper of the place would be guilty of manifest negligence. But no liability would attach on proof that the garageman has used all care reasonably to be expected under the circumstances.

Liability of Lessors of Trucks

Where an owner of motor trucks hires them to another for haulage purposes, furnishing a driver and all supplies, such as gasoline, oil, etc., necessary to run the trucks, is the owner liable to third persons who may be injured through negligence of the drivers while the trucks are being so used?

This practical question is clouded only by the fact that the owner of the trucks retains a measure of control over the use of them by the lessee. Where an owner leases commercial cars to another under circumstances which require the lessee to furnish his own driver and which leave no interest in the owner, excepting the latter's right to return of his property in proper condition and payment of the agreed rental, there is no ground for doubting the owner's freedom from legal liability for injuries which may occur through negligent driving while the cars are under the lessee's control.

But, as indicated in decisions of the Pennsylvania Superior Court, where the lessor of the trucks retains control over their operation, the lessee merely directing that goods or materials shall be hauled from one place to another, the lessor, and not the lessee, must respond for any damages arising from negligent operation of the vehicles.

Buffalo Specialty Company Holds Fourteenth Annual Convention

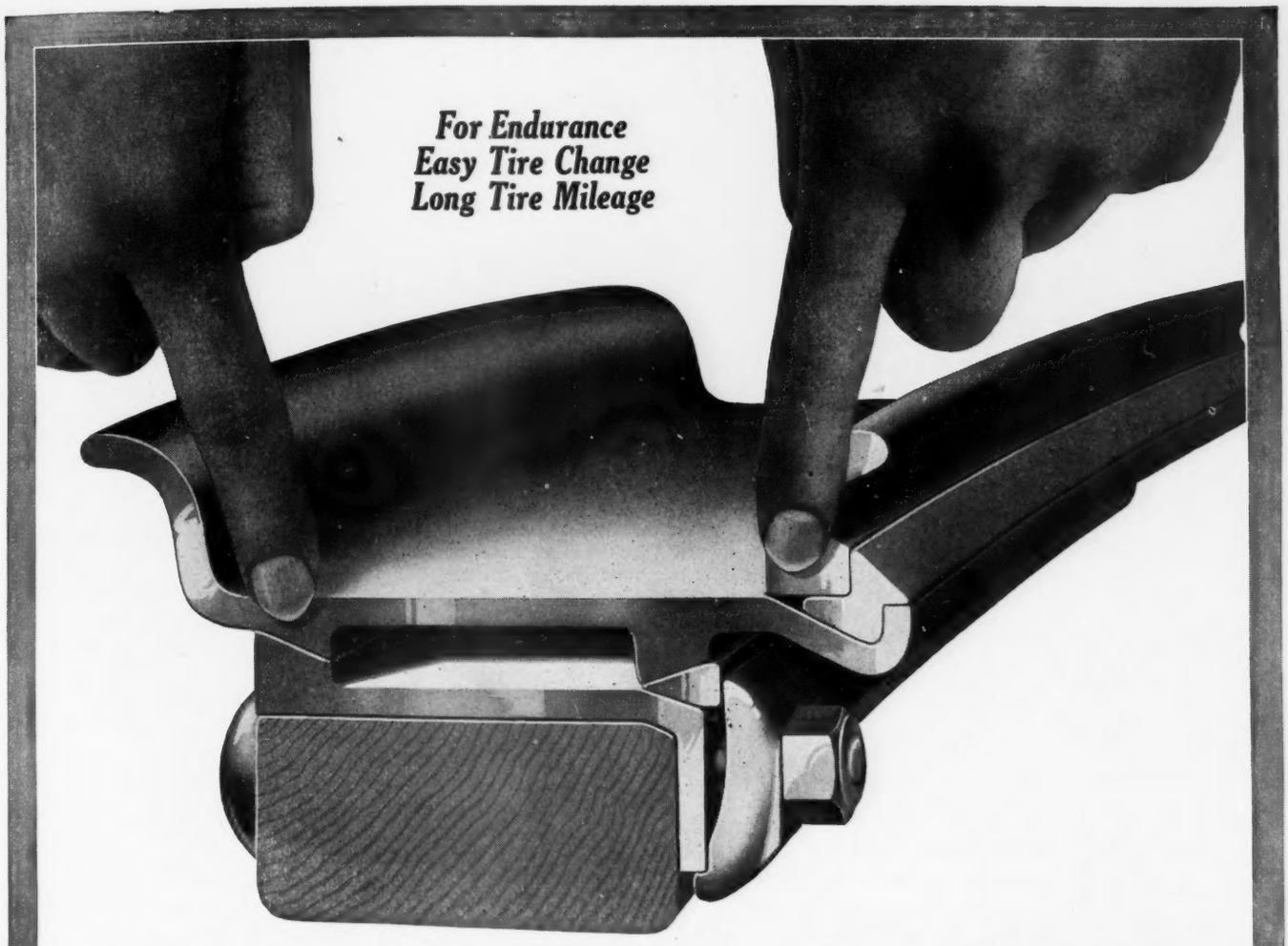
The combined United States and Canadian sales force of the Buffalo Specialty Co., of Buffalo, N. Y., Bridgeport, Canada, and London, England, attended the fourteenth annual convention at Buffalo July 21-26. This company makes Liquid Veneer, Neverleak Tire Fluid and Radiator Neverleak.

Announcement was made at the convention that three new products would be placed on the market this fall; the Liquid Veneer Mop, Neverknock Carbon Remover and Holdfast Gasket Shellac.

Among the many enjoyable events of the convention was a trip to Pine Grove Farms, owned by Mr. Oliver Cabana, Jr., president of the company.

Build Now

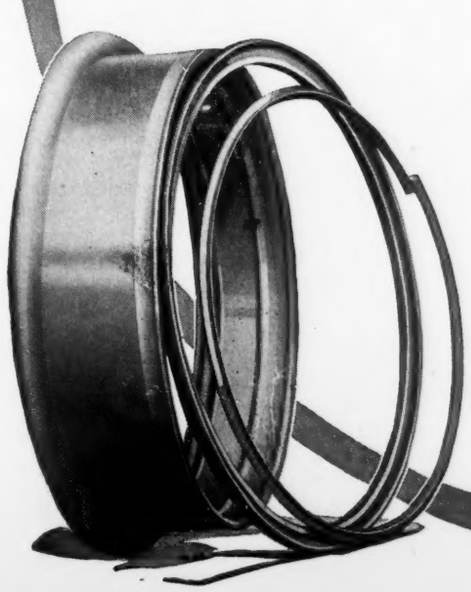
Good roads and see how quickly good times will roll down those roads.



Follow Established Supremacy in Rim Construction

Firestone Type C Rims have these values for Giant Pneumatic Truck Tires:

1. One man can change a Giant quickly on the road. Absolute elimination of squeaking and binding. No more long delays for tire changes.
2. It is the lightest rim of its size and type, diminishing dead weight on tires and yet losing no strength by reason of its lightness.
3. It is constructed to give maximum strength at points of greatest strain.
4. Continuous contact with felloe and continuous wedge-ring support insure perfect alignment, this increases tire mileage by insuring uniform wear.



The above are not theories, but facts substantiated by scientific tests and the experience of thousands of truck owners.

Firestone Type C Rims have for years been standard on the best passenger cars. They are repeating their triumphs as the foundation for the largest pneumatic tire.



The Firestone Steel Products Co.

FIRESTONE PARK AKRON, OHIO

There's a Firestone Rim for every type and size of tire, solid and pneumatic.

Vermont Farmers Just Beginning to Appreciate Value of Motor Trucks

By C. S. PERRIE

"WHAT do I think of the opportunities for selling motor trucks in Vermont?" replied James R. Cartmell, International dealer of Middlebury, when questioned as to the possibilities of truck sales in the Green Mountain State, "why they're great! We are just beginning to get the farmers acquainted with the motor truck and some day, not very far off, there's going to be a raft of trucks in use.

"I have sold a few Internationals and am going to sell more. One of the greatest drawbacks to the sale of trucks in my section, and I guess it is the same elsewhere in the State, is that the farmers have believed that they could use a passenger car, turn it into a truck and get away with it. You see, the majority of them use Ford passenger cars and it is easy for the dealer to sell them the idea of changing over their car by putting a body on it and using it for trucking. Now this might work if it were not for one thing. They overload the converted car and badly overload it. Consequently, on the hills we have around here, it is not long before the car is in trouble. This creates a prejudice against the big truck when you try to sell the farmer. He says he has had experience. And so he has—the wrong kind.

"But we will overcome it in time and the use of trucks of proper capacity around here is changing the feeling. Yes, sir, there's going to be a lot of trucks sold to farmers and I believe it is the best future market we have. Why this country around here is full of rich dairy farms. Some of them are using big trucks. A lot are using passenger car trucks. Later these will buy the big truck, the one or two-ton truck."

Mr. Cartmell is adopting a novel sales plan or rather a publicity plan by using two 2-ton Internationals. In other words, he rents his two trucks by the hour at a price which earns him a profit on his investment. These trucks are busy every day, some nights and Sundays. They perform all kinds of hauling, from moving furniture and supplies to carrying parties to picnics, etc.

At the time the writer visited Middlebury, which has a population of less than 2000, the two trucks were engaged in hauling hay from a farm about six miles distant to the railroad station at Middlebury. It is this year's hay that the trucks are hauling from Bridgeport and the machines are averaging four loads a day in the working day of nine hours. They are carrying on the average 42 bales and these weigh from 130 to 160 lb., which is overloading the truck. There are about 150 tons to be hauled.

The road over which the trucks operate is very poor and there is one grade requiring the use of low gear. The hill is a very long one on which passenger cars are obliged to slip into second, even when a good rolling start is obtained. The air is dry and on a warm day an engine must be efficiently cooled to avoid overheating. One of the trucks has been in service for over three years and during the past year has received no attention other than lubrication and an occasional adjustment.

On the day of the writer's visit one of the trucks had been engaged in hauling a load of furniture to Waterbury, Conn., which indicates that the cars are employed on long haul work as well as short. The use of these trucks, operating as they do, day after day, without trouble, and without being in the repair shop, is teaching the farmers that trucks are dependable, and, as it is common report that Jim Cartmell is making money, the idea of trucks is being planted in the minds of those farmers who have not had success with passenger car trucks. It is but logical to assume that the publicity or demonstration campaign will bear fruit in the near future, at least Mr. Cartmell thinks so, and he has the reputation of being a live wire among his acquaintances. The best part of it is that the demonstrations are paying ones. The method is one that could be copied to advantage by dealers in other sections.



One of the Cartmell International Trucks Unloading Hay
The haul involves a round trip of nine miles, over bad roads and stiff grades, but the truck is making four round trips the day, carrying forty-two bales the load

Goodyear Has Traveling Sales School

The Goodyear Tire & Rubber Co. is now conducting week-end traveling sales schools.

As pressure of business made it inadvisable to take the men off their territories in order to send them to the company's school at Akron for instruction, there seems no other alternative than to send a team of capable instructors to the men in the various branches of the company.

Instruction is given Thursday, Friday and Saturday of each week, the fore part of the week being used by the instructors in preparation and a survey of the field. Class room work covers policy, product and salesmanship with reference to tires, accessories and mechanical goods. The schools keep the salesmen from losing touch with the factory and renew their enthusiasm.

Prest-O-Lite Co., Inc., Indianapolis, Ind., announces the appointment of the following service stations. Ohio: Ottawa—Tire & Battery Co.; St. Mary's—Alt's Storage Battery Service Station; Sidney—Miller & Leoning Storage Battery Station. Pennsylvania: Lewiston—Dean & Thomas; Harrisburg—Atlas Electric Service Co.; Covington—Covington Garage & Machine Shop. Wisconsin: Maunette—Barney Bertrand; Eau Claire—Sorlee Electric Co. Maine: Skowhegan—Pooler & Emery; Rumford—Rumford Battery Service Co. North Dakota: Drake—B. B. Bennett. Arkansas: Newport—T. E. Barker Auto Co. New Hampshire: Littleton—Silsby & Audibert. Illinois: Joliet—Bell & Brown Motor Co. Michigan: St. Joseph—Battery Service Co.; Port Huron—Storage Battery Service. Massachusetts: Salem—A. Michaud. Iowa: Vellisca—Vellisca Battery Co.; Pella—The Electric Shop. West Virginia: Huntington—Motor Sales Co. Nebraska: Fairbury—Fairbury Battery Service.

The Steering Gear *and* its Importance

ROSS GEARS

WHILE the steering gear is far from being the most expensive unit in the truck, most engineers will agree that it is one of the most important.

Considering the element of safety, there is no other part upon which so much dependence must be placed. Every minute that it is in operation, the *safety* of the truck and its load depends largely upon the *steering gear.*

The steering wheel is the chief point of contact which the driver has with his truck — the mechanism through which he *knows* it most intimately. He will like it or dislike it and his efficiency will be increased or decreased according to the ease with which the truck steers.

That these vital points were carefully and successfully considered in the design of the Ross Steering Gears is demonstrated in the esteem in which they are held by motor truck engineers. Over 115 manufacturers, representing considerably over half the industry, are now using them as standard equipment, among the number being many of the largest and best known makers in the country.

The special feature of Ross Gears which distinguishes them from all others is the screw and nut mechanism which transfers the rotation of the steering wheel to the steering arm. The nut is a solid piece, completely enveloping the screw, so that the *entire bearing surfaces of the threads of both screw and nut are utilized.*

These enormous bearing surfaces, together with the quality of Ross material and workmanship, guarantee *easy steering* and *reliable* and *satisfactory service.*

Write for catalog and any special information desired.



The SCREW

This screw is completely enveloped by the nut, thus utilizing all of the bearing surface of every thread in both screw and nut.



The NUT

This nut travels up or down inside the steering gear housing, rotating the cylindrical discs in their recesses. These discs receive the projecting arms of the trunnion shaft and rotate it in turn.



Compare the enormous bearing surfaces thus shown in Ross Steering Gears with other designs in which only three or four teeth are in contact at one time.

The TRUNNION SHAFT

This shaft moves the steering arm forward or backward when it is rotated, through its projecting arms by the rotation of the cylindrical discs in the nut.

The Steering Gears *that* PREDOMINATE *on* Motor Trucks

ROSS GEAR & TOOL COMPANY, 760 Heath St., Lafayette, Ind.

Operate Traveling Shoe-Repair Shop in Baltimore

That often asked question, "I wonder where there is a shoemaker in this neighborhood," caused by the fact that your footwear needs mending, will no longer worry Baltimoreans, for the motor truck has solved the problem.

The idea of placing a shoe mending shop on a truck to visit the various neighborhoods and sections of the city originated in the mind of Henry C. Buchwald, vice-president and secretary of the Auto Truck Transfer Co., of Baltimore.

The outfit has now been in operation for several weeks, but the idea is only in its experimental stage. Up to the present time, according to W. Wharton Weddell, president of the company, it has not proved a financial success, but if it does, he intends to equip another truck in like manner and both will be operated in this city. Any kind of shoe repairing or mending can be done by the machinery with which the truck is equipped. The initial cost for the truck and equipment was $6000. It is an Atterbury truck of two-ton capacity.

Mr. Buchwald and two shoemakers always accompany the truck. The entire cost of operating the shop and machine for a week, including gasoline, oil, garage rental and shoemakers' salaries, is approximately $200 per week. The shoemakers work nine hours per day. It also costs this concern $20 per month for the privilege of running the truck on the Baltimore streets.

"We are not trying to do the work at lower prices than the neighborhood shoe mending shops," said Mr. Weddell, "but our prices are just the same. Of course, the amount of business that can be done depends entirely upon the speed with which the men can work. There are many jobs which only cost 10 cents, while there are larger ones which cost $2.50."

The only method of advertising that this company has used up to the present time is that of circularizing the neighborhood they are going to travel through the next day. Handbills are printed and these are thrown into the doorways of the houses along the route which the truck will take.



This Shoe-Mending Shop on Wheels is Operated by the Auto Truck Transfer Company, Baltimore, Md. The Unique Body is Mounted on a Two-Ton Atterbury

Trailer Makers Urge Uniform State Regulations Concerning Trucks and Trailers

Several states have recently enacted new laws increasing registration fees for motor trucks and trailers and imposing new limitations of size, weight and speed. Similar bills are still pending in the legislatures of a few other states. These laws and bills reveal a lack of uniformity that is unfortunate when it is considered that trucks and trailers are used extensively in interstate commerce and are becoming an important factor in reducing the cost of haulage, thereby tending to keep down the rising cost of living.

Weight and Size Limitations

New laws passed recently limit weight as follows:

Pennsylvania, 26,000 lb. gross weight of vehicle and load.

Wisconsin, 24,000 lb. gross, 18,000 lb. on one axle, and 800 lb. per in. width of tire.

Indiana, 10 tons gross.

Illinois, 16,000 lb. on one axle and 800 lb. per in. width of tire.

North Carolina, 5½ tons load capacity. Iowa, 14 tons gross, 4 tons on any wheel and 800 lb. per in. width of tire.

Dimensions of trucks (which include trucks with semi-trailers) and length of trailer trains are fixed as follows:

Pennsylvania, length of a single vehicle 28 ft., width 90 in.

Wisconsin, length of vehicle 30 ft., width 96 in., length of trailer train 100 ft. between 8 P. M. and 5 A. M.

Illinois, length of train, 65 ft.

A bill pending in Massachusetts limits single vehicles to 28 ft., width to 96 in., height to 13 ft. and length of train to 80 ft.

Another pending in Michigan limits the number of trailers that may be towed by a motor vehicle to two, length of trains to 60 ft. and width 8 ft. 6 in.

Wide Variation in Fees

There is even wider variation in registration fees for trucks and trailers. As fixed in new laws they range thus:

Pennsylvania, $15 for a truck of two tons capacity to $150 for a seven-ton truck, and $2 for a trailer weighing 500 lb. to $15 for one weighing more than 2000 lb. Those weighing less than 500 lb. are exempt.

Indiana, $6 for trucks of ¼-ton capacity to $50 for 7½ tons or more; trailer fees one-half of truck fees.

Illinois, $15 for truck or trailer weighing 7000 lb. with load to $50 for more than 15,000 lb. gross weight.

North Carolina, $12 for truck of one-ton capacity or less to $100 for 5½ tons capacity; trailers, $10 for first ton of capacity and $20 for each additional ton.

Iowa, $15 for trucks of one-ton capacity or less to $175 for solid-tired trucks of six tons capacity; trailers, $10 for one-ton trailer. Rubber-tired trailers under 1000 lb. capacity used with passenger automobiles for personal baggage or effects are exempt.

A bill pending in Massachusetts fixes truck and trailer fees alike at $10 for each ton of carrying capacity.

With such widely varying state laws in force, a truck or trailer that complies with the law in one state cannot be operated legally in another, and a truck owner in one state operates at a serious economic disadvantage against the owner in an adjoining state. If the registration fee is much higher in Massachusetts, for example, than in the adjoining New England states or in New York State, the Massachusetts operator cannot compete in interstate haulage with operators in those states at the same rates without loss. Consequently, the Bay State is penalizing her own citizens and allowing non-residents to use her improved roads at a lower rate than her own citizens can use them or the roads in adjoining states.

With a view to removing these inequalities, the Trailer Manufacturers' Association, which maintains headquarters at 110 West 40th St., New York, is urging the enactment of uniform motor vehicle laws and has drafted a set of recommendations for trailer legislation. It holds that trailer users do not object to paying reasonable fees for use of the roads provided the money is spent in road maintenance, but believes these fees should be the same in all states and should be less than trucks as their wheels do not transmit any destructive driving effort to the road surface.

Trailer manufacturers also hold that the only weight limitation should be that based on tire width. They point out that a truck and semi-trailer, which are regarded as a single vehicle, have six wheels or which the gross weight is distributed and should therefore be allowed one-half more weight than a four-wheeled vehicle. The weight is also distributed over a greater wheelbase and the speed is less than that of a truck alone.

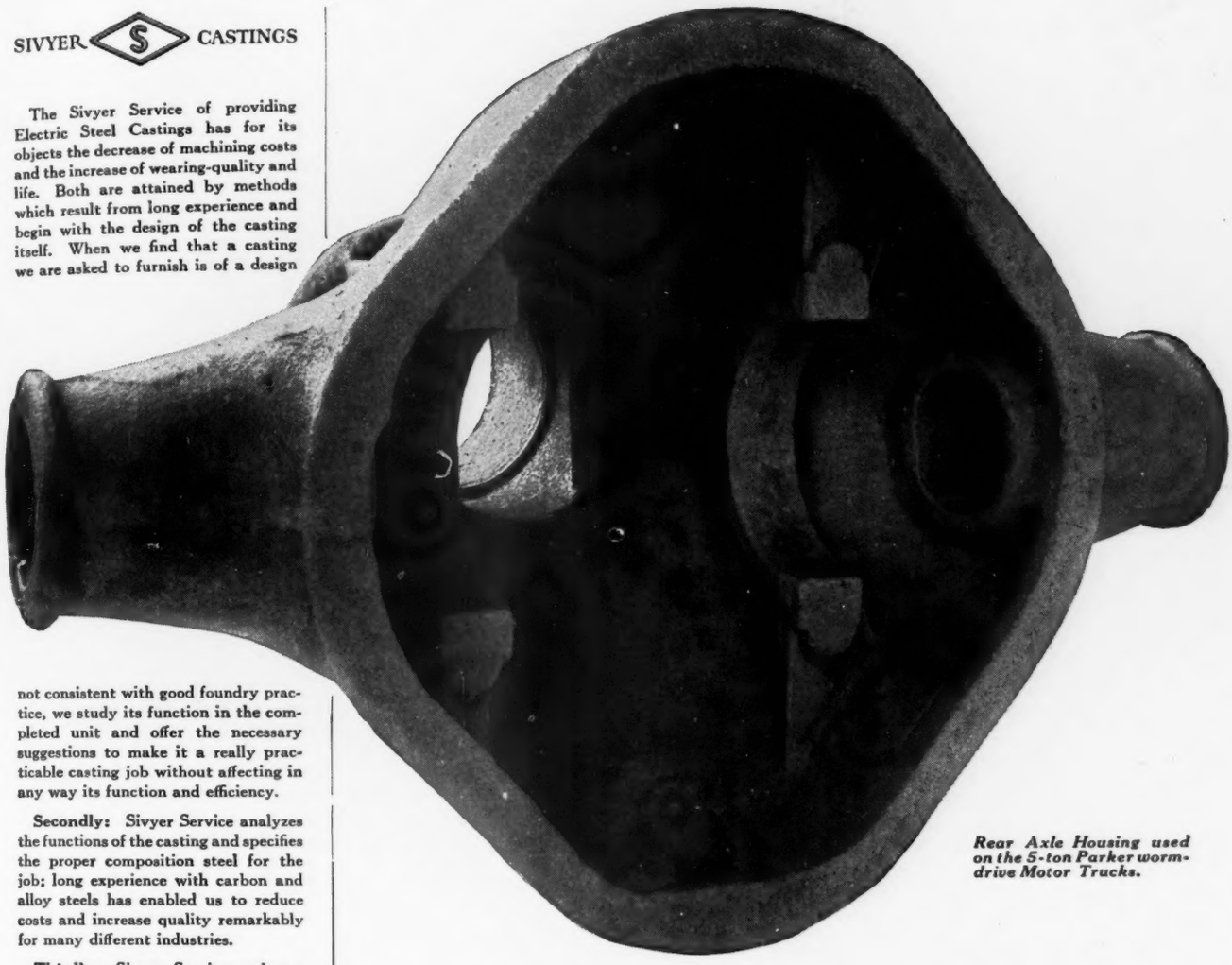
SIVYER CASTINGS

The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing-quality and life. Both are attained by methods which result from long experience and begin with the design of the casting itself. When we find that a casting we are asked to furnish is of a design not consistent with good foundry practice, we study its function in the completed unit and offer the necessary suggestions to make it a really practicable casting job without affecting in any way its function and efficiency.

Secondly: Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly: Sivyer Service makes a careful study of the pattern and molding problems involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

Fourthly: Sivyer Service analyzes carefully the proper annealing methods to be used and controls their proper application through unfailingly efficient equipment and men. In short, the Sivyer Service supervises every step necessary to secure unusually and unfailingly good castings of electric steel. It never relies on one factor alone, relies very little even on the natural freedom of electric steel, from occluded gases and on its commonly recognized merit in resisting crystallization. It also depends but little on the inherent scientific accuracy of the electric furnace process. From casting-design to sand-blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.



Rear Axle Housing used on the 5-ton Parker worm-drive Motor Trucks.

THE thin metal sections and the heavy bosses of the casting shown above caused expensive losses when attempted by ordinary methods. It was difficult to get the metal to run in the thin sections, so that many castings used to have a tendency to crack and draw. When we were finally given a sample order for this job, we devised fitting methods of heading, gating, and of mixing and molding the core sand — and overcame all difficulties. It is the solution of problems such as those involved in this housing that has won for Sivyer Castings their nation-wide market.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

It is further maintained that as trailers are designed to track with the rear wheels of the towing vehicles, they do not interfere with or endanger other traffic on the open country roads and the number of trailers that may be hauled by a truck or tractor should not be limited to one or two. If cities are authorized to limit the number in congested streets and districts during the daytime, the safety and convenience of general traffic will be sufficiently guarded and development of economy of haulage in remote mining, lumbering and agricultural sections will not be prevented.

They Tour in Their Own "Pullman"

The accompanying illustration shows the "Hotel on Wheels" which aroused a great deal of interest at the Indianapolis Races on Decoration Day, when it was given its maiden trip from Marion, Ind., to Indianapolis, by C. G. Barley, president of the Indiana Truck Corp., who, with Mrs. Barley and Mr. and Mrs. Harry Goldthait, of Marion, Ind., have started aboard it for a round trip from Marion, Ind., to California, a total of about 4000 miles.

Thousands of people at the Indianapolis Races viewed the "Hotel on Wheels." It is complete to the last detail. There are sleeping compartments for four people, with glass windows that can be raised and lowered, in the side of the body. Beneath each sleeping compartment is a commodious chest for clothing. At the rear of the body is a complete kitchen equipment.

The rear is also equipped with a motorcycle for special errands that may take the driver of the truck off the main line of travel. A complete Delco lighting system which furnishes twenty-five electric lights is utilized, with batteries, generator and motor. Compartments on the outside of the truck contain tools, ropes and various other equipment that is likely to be needed. The truck is equipped with water tanks and pumps and modern sanitary plumbing. It is equipped with large Firestone pneumatic tires. A large tent fly can be stretched from the top of the truck to a distance ten or fifteen feet away.

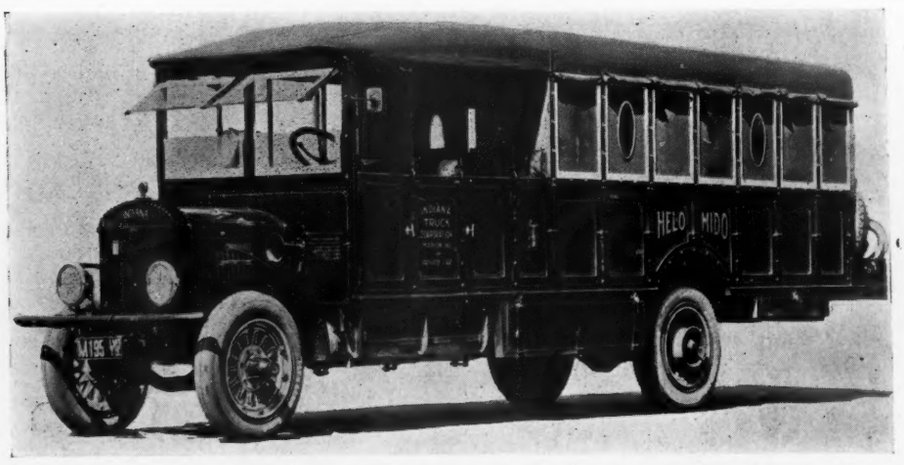
The driver sleeps on a specially devised seat which can be turned into a bunk at night. This unique body is mounted on a 2-ton Indiana truck chassis, the frame lengthened to meet body requirements. It has shock absorbers.

Regarding Damages to Car Standing in Road

SPOKANE, WASH., July 30.—A legal decision of considerable interest and importance to motor owners regarding the question of whether the owner of an automobile may leave it standing in the road while he wends his weary way to the nearest garage, be it one or ten miles, to secure repairs, has just been handed down in the county court at Wallace, Idaho. The action was that of R. L. Stout against Bert Fox. Justice Grove held that "no one has a right to injure property of another, said property being immovable at the time of accident, although said property was obstructing a public highway" and judgment was entered for the complainant in the full sum of his demand, amounting to $48.79, the costs of the repairs to his car.

According to the complainant in the case, which has been appealed to the district court, Stout is the owner of a King touring car and while driving up Pine Creek he broke a spindle and was unable to go further. Leaving his car in the middle of the road where it broke down, he started back to Kellogg afoot to secure the necessary repairs. While he was gone Fox came down the road with a load of hay and, according to the complainant, carelessly and negligently drove around the car and in so doing collided with it, breaking the front and rear fenders, the running board and otherwise damaging it.

Syracuse Rubber Co., Inc., Syracuse, N. Y., has been organized with a capital of $3,000,000 to manufacture a cord tire, to be known as the Syracord. Officers of the company are: E. R. Caldwell, president; Richard Byrne, vice-president; George R. Loggie, treasurer and general manager; R. L. Caldwell, secretary. W. E. Greer will be factory superintendent and manager.



"The Hotel on Wheels" is the Property of C. G. Barley, President of the Indiana Truck Corporation, Marion, Ind.

Special Eighty-Passenger Trailer Bus

Future possible development of passenger transportation for communities not adequately served by railroad is indicated by the growing popularity of the trailer bus. A special trailer bus has been designed to meet the requirements of a large oil company in transporting its employees to its works in Morgan, La. The body has a seating capacity of eighty passengers and is mounted on a semi-trailer car. It is 25 ft. long, 7 ft. wide and 6 ft. high. The interior has four longitudinal seats.

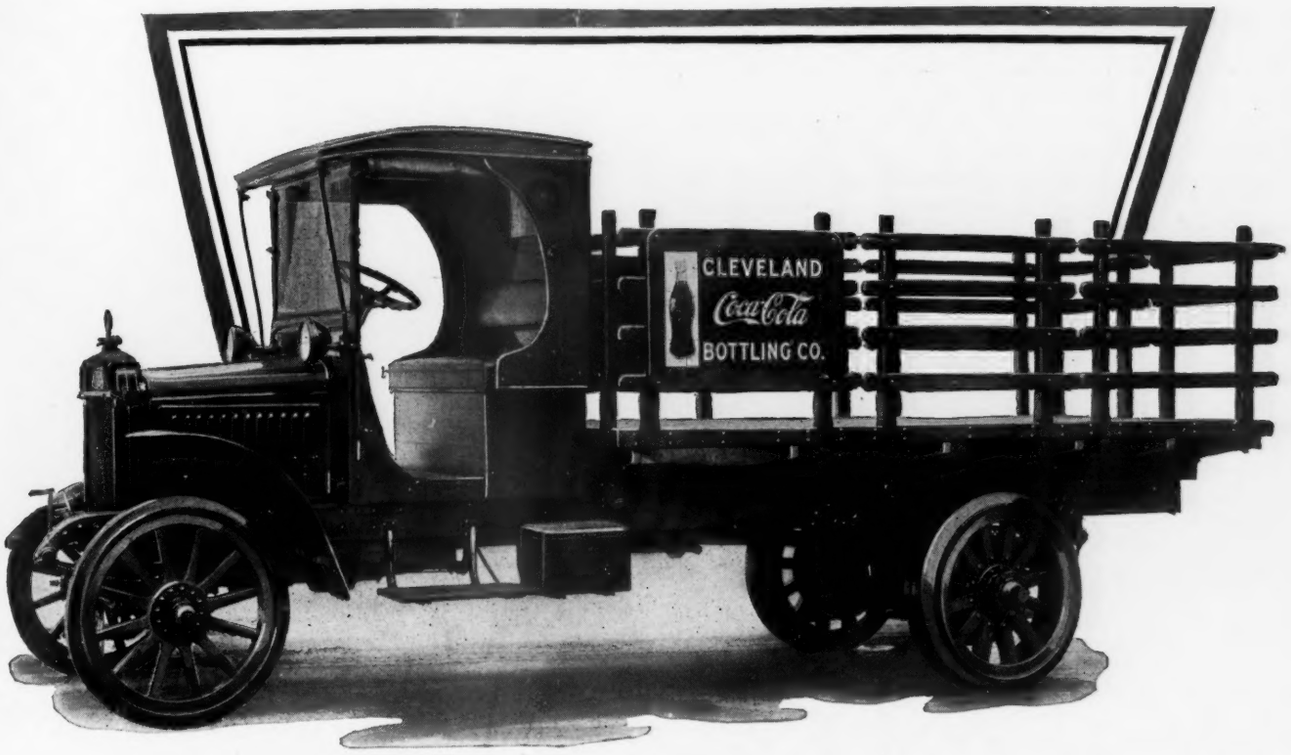
The trailer and body were built by the Texas Wagon Co., of Houston, Texas, and are drawn by a Mack short-wheelbase tractor. The rear wheels and axle turn under the body like the front wheels of a wagon, and are connected by an extension pipe pole under the center of the body through a universal joint with a corresponding pole from the tractor, so that all of the trailer wheels track with the rear wheels of the tractor. This permits the outfit to make short turns without cutting corners and to be used wherever space permits the tractor to go. It can be backed like an ordinary truck.

The rear end of the tractor is fitted with a tilting fifth wheel which carries the front end of the body. Swinging bolsters support the body near its two ends. Draft or pull of the tractor is through two chains fastened to the side members of the tractor frame and to a singletree attached to the pipe pole under the body. This brings the draft at the lowest possible point without placing it directly on the axle. When turning corners the length of the chains is equalized through sliding clips on the singletree, to which the ends of the chains are attached.

With regard to the performance of this tractor and trailer bus, the superintendent of the oil company states that it carries between 85 and 100 passengers regularly and has worked satisfactorily. If the company had another point where it needed to carry a number of passengers and had a suitable roadway, he would recommend a similar outfit there, he says.

French Tariff Ruling on Tires

Commercial Attaché C. D. Snow cabled from Paris on July 21 that under the new decree of July 8 repealing the ad valorem surtaxes and establishing coefficients for increasing the specific duties, the coefficient for automobile tires has been fixed at 1.3. This is equivalent to an increase of 30 per cent. in the former rates of duty, and the present duties on imports from the United States are, therefore, 195 francs per 100 kilos, or $17.07 per 100 lb., for pneumatic tires, and 130 francs per 100 kilos, or $11.38 per 100 lb., for solid tires.



Why the Biggest Soft Drink Distributors Use Atterbury Trucks—

When an Atterbury dealer sells a truck to a soft drink or ice cream manufacturer or distributor — he knows it is going to give absolute satisfaction.

10 years of truck making experience behind each ATTERBURY

From coast to coast Atterbury service is a constant marvel to both user and dealer, because:

1. The Atterbury has more power and speed than most trucks of similar rating.
2. Its dependability is simply phenomenal.
3. Upkeep expense is reduced to a minimum.
4. Atterbury construction protects the parts that constantly dripping brine would quickly rust out in most trucks.

These are the things that the biggest distributors and manufacturers have proved—and these are some of the reasons why Atterbury dealers are so enthusiastic.

ATTERBURY MOTOR CAR CO., BUFFALO, N. Y.

ATTERBURY

MOTOR TRUCKS OF MAXIMUM SERVICE

Metal and Rubber Markets

Steel Prices Firm, With Indications of Advances

The tone of the steel market is reported as very strong at the present time. The independent concerns have announced increases frequently within the past few weeks, but the Steel Corporation is adhering to its policy of maintaining the full prices of the late industrial board and is not leaning toward further advances at the present time. Interests engaged in exporting report that inquiries in that field are of fair volume.

It has been feared for some time that the generally favorable tone prevalent in the steel trade might be interrupted by strikes, but reports from the Sharon district indicate that workers in the tinplate and steel mills of the Steel Corporation have gone on record as being opposed to a strike as a means of gaining the unionization point urged by the labor leaders. With production still increasing and mill operations at constantly higher rates, it is almost certain that there will be no further trouble with the laborers.

Steel Products Prices

Per ton, Pittsburgh—	
Bessemer billets	$38 50 a ....
Open hearth	38 50 a ....
Forging billets	51 00 a ....
Sheet bars	42 00 a ....

Sheets

The following prices are for 100-bundle lots and over, f.o.b. mill:

Blue Annealed Sheets—	
Pittsburgh	$3 55 a ....
Philadelphia	3 79 a ....
Chicago	3 82 a ....
Galvanized Sheets of Black Sheet Gauge—	
Pittsburgh	$5 70 a ....
Chicago	5 97 a ....
Tin—Mill Black Plate—	
Pittsburgh	$4 35 a ....

Tin Plate

Tin plate, pme., per base box	$7 00 a ....
Terne plate, I. C.	7 05 a ....

Iron and Steel at Pittsburgh

Bessemer iron	$29 35 a ....
Bessemer steel, f.o.b. Pittsburgh	38 50 a ....
Skelp, grooved, steel	2 45 a ....
Skelp, sheared, steel	2 65 a ....
Ferromanganese (80 per cent.)	115 00 a ....
Steel, melting scrap	17 50 a ....
Steel bars	2 35 a ....

COPPER.—The copper market exhibits a generally firm tone. The fact that sellers are refusing at the present time to quote for delivery past September is regarded as an indication of the strength of the general situation.

ALUMINUM.—The market is reported quiet, and 98 to 99 per cent. ingots are now quoted at 33 cents per lb.

TUNGSTEN.—Pending developments in Europe the market here remains firm at $7.25 to $7.50 for Chinese Ore spot, $6.75 for Chinese ore for shipment and $10.00 asked for Bolivian ores, while the home producers of Scheelite are adhering to the price of $15.00 f. o. b. California or Nevada, freight payable by the buyer.

Other Metal Products

The following prices are current on brass and bronze items:

Copper sheets, hot rolled	33 50 a ....
Copper sheets, cold rolled	35 00 a ....
Copper bottoms	41 50 a ....
Seamless tubing, bronze	40 00 a ....
Cut lead sheets	9 00 a ....
Copper rods	24 25 a24 50
Copper wire	26 00 a ....
High brass wire	27 75 a ....
High brass sheets	27 75 a ....
High brass rods	26 75 a ....
Low brass sheets	30 50 a ....
Low brass wire	30 50 a ....
Low brass rods	31 25 a ....
Brazed tubing, brass	39 00 a ....
Brazed tubing, bronze	44 25 a ....
Seamless tubing, brass	36 00 a ....
Seamless tubing, copper	37 75 a ....

Prices of Old Metals

Aluminum is steady. Copper and composition are quiet. Current prices follow:

	Buying.	Selling.
Aluminum—		
Cast scrap	21 a21½	23 a24
Sheet scrap	22¼a22¾	24 a25
Clippings	23½a24½	26 a27
Copper—		
Heavy machinery comp.	16 a17	18 a19
Heavy and wire	17 a17½	18½a19½
Light and bottoms	14½a15	16 a17
Heavy, cut and crucible	17½a18½	20 a21
Brass, heavy	10 a10½	12 a12½
Brass, casting	12 a12¼	13¼a14
Brass, light	8 a 8½	10½a11¼
No. 1 clean brass turngs.	10 a10½	11 a11½
No. 1 comp. turnings	14½a15	16 a17
Lead, heavy	4¾a 5	5½a 5⅝
Zinc scrap	4½a 4¾	5½a 6
Block tin, scrap	55 a58	60 a61

Rubber Market Firmer

The rubber market, of late, has shown a generally firmer tone and prices have been somewhat higher for stock in all positions. During the early part of the month the market was extremely dull, business being held in abeyance pending the receipt of cable advices concerning the status of negotiations previously entered upon, and the state of the market in the Far East.

Para—Up-river, fine, per lb.	55 a ..
Up-river, coarse	32 a ..
Island, fine	47½a ..
Island, coarse	21½a 22
Caucho, ball, upper	32¼a ..
Caucho, ball, lower	.. a ..
Cameta	21½a 22
Plantat'n—First latex, pale crepe	41 a ..
Brown, crepe, thin, clean	34 a 35
Smoked, ribbed sheets	40 a ..
Centrals—Corinto	35 a 37
Esmeralda	35 a 37
Guayule, wet	25 a ..
Guayule, washed and dried	.. a ..
Balata, block, Ciudad	.. a 75
Balata, block, Panama	55 a 60
Balata, sheet	*1 00 a ..
Mexican—Scrap	39 a ..
Slab	32 a ..
African—Massai, red	.. a ..

* Nominal.

Prices of Crude Rubber

SCRAP RUBBER.—The situation is unchanged. Buyers and sellers are apart in their views and no business of importance is being done.

Tires—Automobile	3½a ..
Bicycles, pneumatic	2¾a ..

Federal Trade Commission Takes Up Question of Basing Point for Steel

The vexed question of a single or plural basing point for steel products has been taken up by the Federal Trade Commission. The carefully prepared complaint of the Western Association of Rolled Steel Consumers has been received. The nominal respondent is the United States Steel Corporation, but every maker and user of steel products is interested in the outcome.

The Federal Trade Commission was urged by both the parties of record to take jurisdiction as the basing point for steel prices had been a bogie in the trade for years. Judge E. H. Gary, of the Steel Corporation, has said that this action is "the biggest lawsuit ever tried in this country."

After due opportunity has been given for all interested parties to submit statements to the Commission regarding their positions, and other information deemed necessary by the Commission has been obtained, public hearings will be held by the Commission, which interested parties are invited to attend, in order to determine whether the application should be granted, or other action taken according to the facts so developed.

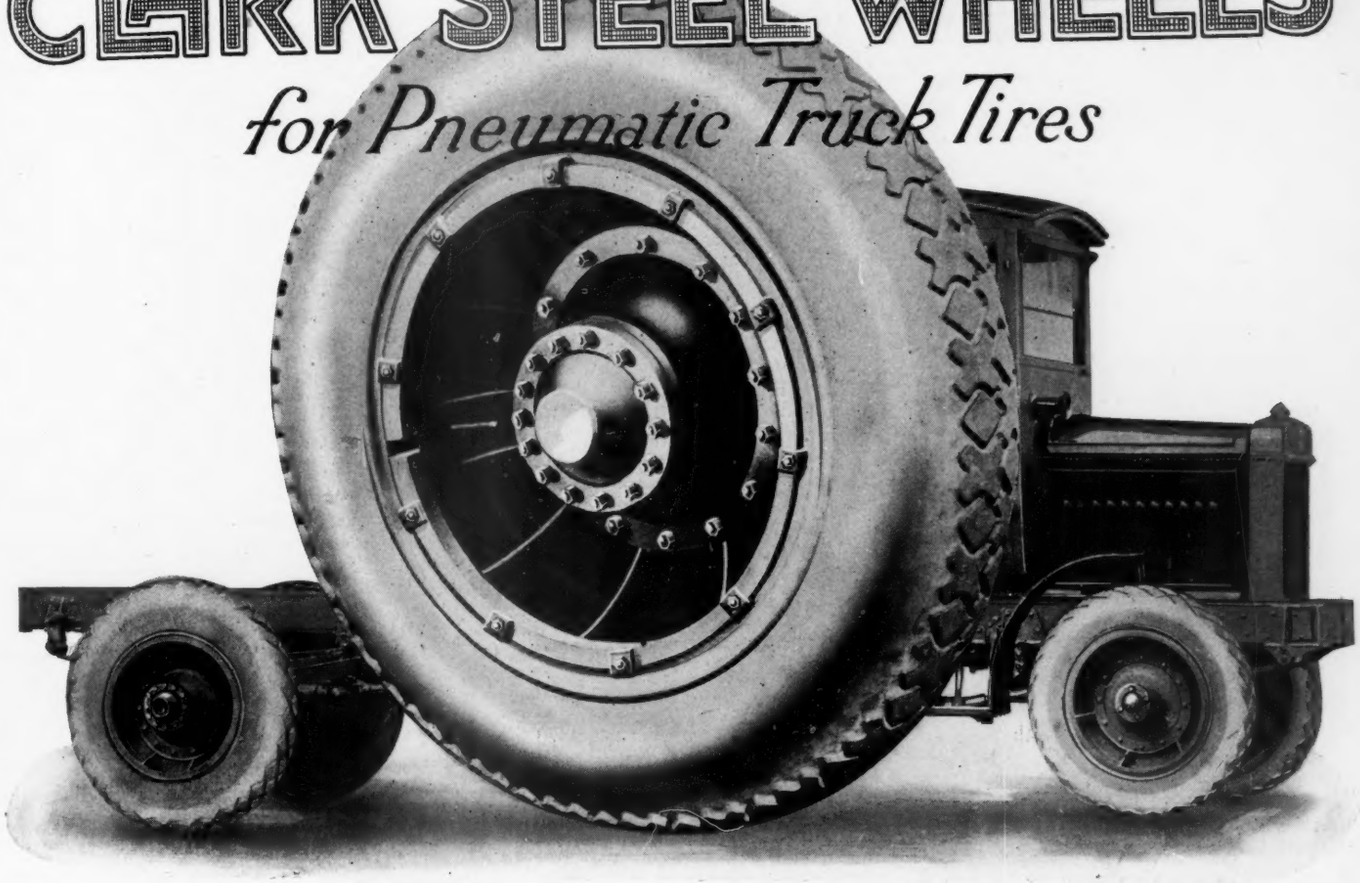
The question raised by the applicant may not be the only question involved in this matter and the remedy suggested by the applicant, namely, to make Chicago a basing point, may not be the only remedy, or the appropriate remedy, even in the event that the applicant's contention is found to be valid. In other words, the whole question of the practice of having basing points for making rolled steel prices may be involved, as well as the question whether Pittsburgh or some other place should be the sole basing point, or whether there should be more than one basing point.

The Board of Trade, of Superior, Wis., has raised the same question with the Federal Trade Commission and several other complaints have been received. The Chamber of Commerce of Birmingham, Ala., has notified the Commission that it desires to be heard. All these complaints will be consolidated into the single proceeding.

The application for complaint made by the Western Association of Rolled Steel Consumers says the membership comprises over seven hundred fabricators of steel, operating in Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, Kansas, Missouri, Montana, Nebraska, Oklahoma, South Dakota, Texas, Utah, Washington, Wyoming, Colorado and California, all being tributary to what is known as the Chicago district; that the United States Steel Corporation mill at Gary produces steel at a cost substantantially lower than at the Carnegie Plant of the Steel Corporation at Pittsburgh or at other corporation plants in Pennsylvania; that over one-fifth of the rolled steel made in the United States is made by the respondent at Gary, Ind.

CLARK STEEL WHEELS

for Pneumatic Truck Tires



Clark Steel Wheels for pneumatic tires are of our well-known disc construction (particularly adaptable to this type wheel. The limited diameter of the wheel practically eliminates spoke construction) giving a symmetrical and simple design with greatest possible strength. This strength is increased by proper webbing from disc to rim, providing lightness with requisite strength.

Made for standard demountable rims, also with solid rims for quick detachable tires; for any capacity truck or any make of axle.

New booklet—ready for mailing—explains many advantages

CLARK
Rear Axles · Steel Wheels · Locking Differentials
For Motor Trucks
EQUIPMENT

Clark Equipment is found only on good motor trucks

Clark Equipment Company
Buchanan **Michigan**

Also makers of Clark Internal Gear Axles

The applicant submits that the normal, reasonable price for rolled steel should be measured by cost of production with addition of reasonable profit and without addition of a large and arbitrary increase which forms no part of the production cost and is over and above such reasonable profit. The applicants declare that despite the fact that steel is made more cheaply at Gary, the complainants are compelled to pay a set price, plus a freight rate of $5.40 per ton, from Chicago to Gary, although, in fact, the steel is not actually shipped from Pittsburgh at all.

Certain discriminations in price, especially to agricultural implement manufacturers, are charged by the steel consumers and the whole is alleged to be so repugnant to the Federal Trade Commission law and the Clayton law that it should be ordered discontinued.

The filing of the complaint of the steel consumers followed an informal hearing before the Commission at the request of Judge Gary and Judge John S. Miller, counsel for the rolled steel consumers.

In urging that the Commission go into the subject thoroughly, Judge Gary stated:

"The iron and steel industry in this country really started at Pittsburgh many years ago. That was then probably the cheapest point of production, largely because the fuel was there, in immediate proximity, and the iron ore was brought on the lakes to Conneaut, north of Pittsburgh, and brought by a short railroad to the furnaces; and the limestones were in that vicinity. It was the cheapest point for the assembling of the raw materials, and consequently, the cheapest place for producing iron and steel.

"That being so, of course, the iron and steel products which were manufactured were sold at a price f.o.b. works or f.o.b. mill, which meant f.o.b. Pittsburgh. Then, later, works were started at other places—Youngstown, not very far from there; Johnstown, in the other direction, not very far from Pittsburgh—and the manufactured products were sold then f.o.b. Pittsburgh."

During these years the custom of the Pittsburgh basing point became so fixed in the steel industry that a change will cause far-reaching results. How serious these resulting changes and how serious the hardships, if any, caused by the present custom, are the questions to be argued out before the Trade Commission.

Atlantic Express to Operate Between Portland and Boston

PORTLAND, Me., July 28.—The Atlantic Express, Inc., Portland, Me., will not operate a Rural Motor Express service between that city and Portsmouth, N. H., as has been announced in some trade papers. The company will inaugurate motor highway transportation between Portland and Boston, serving Portsmouth and possibly one or two other cities. The company expects delivery of four 5-ton and two 2-ton Pierce-Arrow trucks with special bodies which will be constructed at the factory at Buffalo. The trucks will be operated at night, leaving Portland at six and arriving in Boston the following morning. The return trip will be operated on the same basis. A terminal will be arranged at either end, and all towns east of Portland will be supplied by electric freight service. The Atlantic Express has been engaged in general expressing in Boston and Portland for some time and will continue to use horses for collection and delivery of small lots in both cities. Linwood E. Porter is president and general manager. The terminal facilities will be such as to eliminate waste motion and to conserve labor. The service will be started upon the arrival of the trucks, expected next month.

Readjustment and Reconstruction is the title of a book prepared by the United States Council of National Defense. It contains information concerning the reconstruction policies pursued in foreign countries. One copy has been sent to each of the chambers of commerce in the United States and two copies to each public library, where they may be consulted by exporters, etc., interested in conditions in these countries.



This Two-Ton Stewart With Long Wheelbase is Used as a Sight-Seeing Bus. It Runs Between Buffalo and Niagara Falls. The Body Has Seating Capacity for Thirty Passengers

New York State Highway Council Formed

NEW YORK, July 21.—The New York State Council of the Federal Highway Council was organized at a meeting held last Friday in the rooms of the American Society of Civil Engineers in New York City. Sole purpose of the organization of the council is to secure state-wide support for the enactment by Congress of legislation embodying principles set forth in the Townsend Bill providing for the creation of a Federal Highway Commission and the construction and control of a system of national highways with funds appropriated by the Federal Government. Permanent organization of the state council was effected by election of the following officers:

Chairman, Arthur H. Blanchard, president of the American Road Builders' Association and president of the National Highway Traffic Association.

Vice-chairman, Fred S. Green, Commissioner of Highways, Albany; Col. Theodore Roosevelt, New York City; E. J. Mehren, managing editor, "Engineering News-Record," New York; George M. Graham, member Motor Truck Committee, National Automobile Chamber of Commerce, New York, and sales manager Pierce-Arrow Motor Car Co., Buffalo, and D. C. Fenner, of the International Motor Co., New York and member Legislative Committee, National Automobile Chamber of Commerce.

Secretary-treasurer, H. W. Perry, general manager, Trailer Manufacturers' Association of America, New York.

It was voted that the foregoing officers constitute the executive committee, and that the chairman should appoint county representatives throughout the state. The county representatives will be asked to urge local organizations, such as boards of trade, chambers of commerce, rotary clubs, good roads associations, automobile clubs and automobile dealers' associations to give their support to the Townsend Bill by passing resolutions favoring the principles embodied in it and by urging their senators and representatives in Congress to support and vote for the bill.

Similar state councils are being formed in other states under the direction of the Federal Highway Council in Washington.

Noble Motor Truck Co., Kendallville, Ind., held recently its first annual meeting of stockholders. The following directors were named: C. J. Munton, G. M. Patterson, Grant Roberts, A. M. Jacobs, J. L. Hauff, B. S. Walters and J. C. Fetter. Officers elected at the meeting are: C. J. Munton, president; J. L. Hauff, vice-president and general superintendent, and G. M. Patterson, secretary-treasurer.

United Motors Service, Inc., Detroit, service department of Delco, Klaxon and Remy, has opened a branch office in Toronto at 88 Adelaide St., West. C. D. Fairweather is branch manager.


CLARK
Rear Axles · Steel Wheels · Locking Differentials
For Motor Trucks
EQUIPMENT
THIS 4-ton truck, owned and operated by Quigley & Roberts Co., Jacksonville, Oregon, is equipped with a Clark Internal Gear Axle and Clark Steel Wheels.
Clark Equipment helps motor trucks solve heavy transportation problems.
Informative literature on request
CLARK EQUIPMENT CO.
Buchanan——————Michigan
Clark Equipment is found only on good motor trucks

Solving a Hurry-Up Loading Problem With a Truck

By the Use of a Novel "Loader" and a Truck, the Littlefield Ice and Coal Company, of Hammonton, N. J., Has Solved a Problem of Loading Ice Into Refrigerator Cars

In the summer a large amount of ice is sold to fill refrigerator cars for shipping berries and fruit. This section is noted for the quantity and quality of berries and peaches grown here. Shipment to Philadelphia and to New York is made overnight in box cars by freight but shipment to more distant points, such as Boston, must be made in refrigerator cars, sent by express.

Naturally, the icing of these cars is a "hurry up" proposition. Market conditions change very quickly and shippers may suddenly decide to send one or two more cars to Boston or some other market instead of New York and the cars must be gotten ready at once. This may be in addition to the two or three cars going out regularly. As each car takes from three to five tons of ice the loading of them is a man's size job. Then, too, it is not always easy to secure extra help for a short time, just when needed.



The New Loader Has an Endless Belt. At the Top a Chute at Right Angles Which Discharges Directly Into the Freight Car.

The Old Way of Doing It

The ice is hauled from the plant to the railroad siding in a Ford one-ton truck or quad. The distance is about ¼ mile or less. The hard part of the work is to move the ice from the body of the truck to the openings in the tops of the cars. Formerly this was done by hand. A light portable wooden tower was set up alongside the car and the ice passed from man to man. This method was slow, it required several men to work it at all, the ice had to be broken into small pieces, and the work was very dissatisfying to the men.

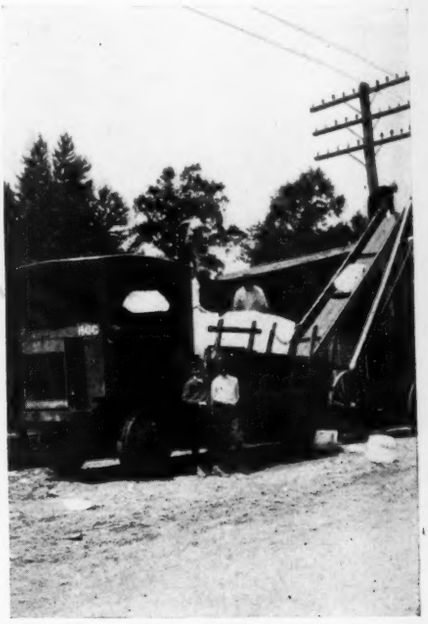
A big improvement was made by using the truck itself to pull the ice up, a full cake or a half cake at a time by an arrangement of rope and pulleys. An A-shaped wooden frame was put up against the side of the car. The frame had a pulley at the top and another one near the bottom. The frame was covered with 1 in. boards to prevent the cakes from hitting the side of the car. A rope was run through the pulleys with a pair of tongs at one end. The other end was hooked to the truck frame. When the truck started the cake of ice swung up and back toward the car, hit the A frame on the way up and at the height of the car roof was taken off by a man there. The truck then backed to the car and the process was repeated. Sometimes another car was used to do the pulling.

By this method of loading a car could be filled in one hour, using a driver and helper and two men on the car roof. This compared with three hours or more by the hand method.

Naturally the hauling ability of the truck in this work depends upon the speed with which the ice can be put in the cars. The truck is doing no hauling while being unloaded.

How the New Method Works Out

A new loader has just been built and put in service by the company, which is a great improvement on even the hoisting arrangement. The loader consists of an incline with an endless belt and wide cleats bolted to the belt to pull the pieces of ice up the incline. At the top is a chute at right angles to discharge directly into the opening in the car roof. The outfit is operated by a gasoline engine and is mounted on a



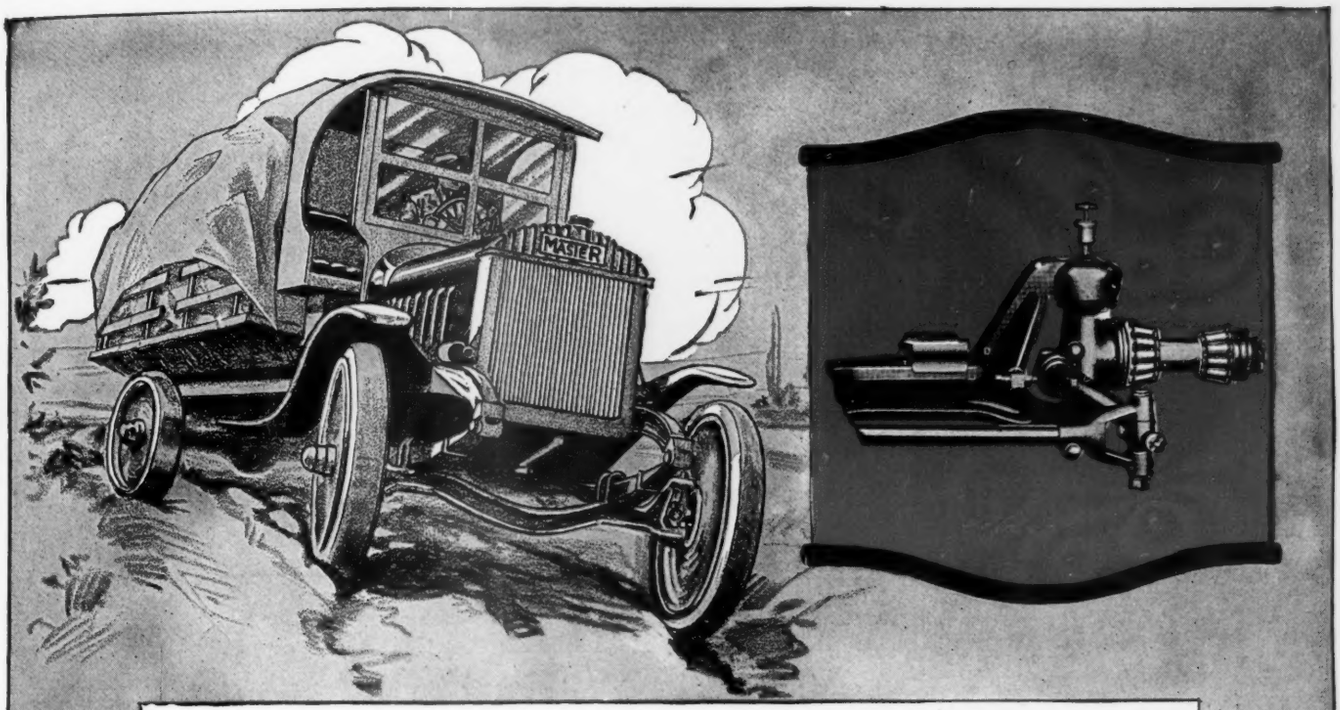
When the Cars Are Placed Alongside the Loading Platform a Longer Runway is Used to Carry the Ice Over.



This Illustration Shows the Construction of the New Loader



Formerly Ice Was Moved by Hand From Truck to Roof of Car



balanced oversize

THE peculiar "twist" shown by the illustration above would put an overbearing strain on even the best made truck of conventional construction, but *not* on the "BALANCED OVERSIZE" MASTER TRUCK.

The endurance and *strain-absorbing* power of the MASTER is due to this special engineering feature of "BALANCED OVERSIZE," by means of which unusual strength and size are secured without resulting UNEVEN WEAR on the SMALLER PARTS.

Perfect balance—harmonious working of ALL parts—the weakness of NONE—make THIS truck "MASTER OF THE LOAD ON ANY ROAD;" a safe truck to buy—a safe truck to sell.

Mud, sand or hills look alike to the MASTER TRUCK. It's built to go, AND DOES IT! No strain or stress can make it less than the Super-Truck it is—the truck that answers all the "WHYS"—because of "BALANCED OVERSIZE."

Your territory may be open. Write or wire for our proposition to dealers

11 Models in 6 Sizes—1½ to 6 tons

MASTER TRUCKS, Inc. 3132-3138 S. Wabash Ave., Chicago, Ill.



MASTER TRUCKS



MASTER OF THE LOAD ON ANY ROAD

two-horse wagon. It is towed to the refrigerator car by the truck itself.

In operation the truck backs up to the loader which has been placed alongside the car. The truck driver puts the ice on the bottom of the incline. It is taken up the incline by the belt and falls by gravity directly into the car. Only one man is needed on the car roof and he has very little to do until the ice compartment is almost filled, when he pushes the ice into the far corners. The first day the loader was used, a ton of ice was put in the car in three minutes. Truly a remarkable improvement over former methods.

An important fact is that only two men are necessary to operate the loader, although a helper can be used on the truck. The saving of time of the truck is very desirable, as this work is in addition to the retail ice business of the company.

When the cars are placed alongside the freight loading platform a longer runway is used to carry the ice over. An extra man is needed to push the ice across. Whenever possible the cars are placed on a siding where the loader can be placed right up to the freight car, but sometimes cars must be iced while up at the loading platform.

With hand loading it always took much longer to fill a car placed alongside the platform, as all the ice had to be carried across the platform. With the loader in use the car can be filled as quickly as when on the siding, but another man must be used in the crew.

The Littlefield Ice & Coal Co. has all motor equipment for their business. All of the horses formerly used have been replaced by trucks. Even the power for the ice plant itself comes from a Diesel oil engine. In place of the old heavy "ice wagon" pulled by horses, a remodelled Ford touring car is used. The service area covered by this company is a town of 6000 people, but the town limits extend over what is really a township. The route covered is about thirty miles long, so speed between stops is essential.

The Ford one-ton truck is equipped with pneumatic tires in the rear in place of the solid tires which are regular. These tires give very good traction in sand and also allow the truck to go over lawns, when necessary for coal delivery, without cutting into the grass.

The remodelled Ford touring car is used during the winter for half-ton deliveries of coal. The one-ton truck delivers most of the coal in the winter and part of the ice in summer.

A Quad truck was purchased for two-ton deliveries of coal, but during the coal shortage in the winter of 1917-1918 two-ton deliveries could not be made. This truck was rented for several months for construction work on the shell loading plant of the Atlantic Loading Co., at Amatol, N. J. This plant when completed would have been the largest shell loading plant in the United States. Since the signing of the armistice, the plant has been taken over by the U. S. Government as the Amatol.

Highway Shipping Cheaper Than Rail

Careful comparison of the cost of shipping by motor truck and by rail, as made by the Fisk Rubber Co., of Chicopee Falls, Mass., shows that it is cheaper to make shipments from the factory to New York and Boston by motor truck than by railroad express or freight.

The analysis made by the company's road transportation department, which has been in operation for some time and has greatly developed, is based on the operation of fifteen motor trucks, including trucks of ¾, 2, 3 and 5 tons capacity, or near Springfield, Mass., to do its hauling to Boston with its own motor trucks of 2, 3 or 5 tons capacity than it is to ship by freight, provided full loads are carried by the 2- and 3-ton trucks and loads of 2½ to 5 tons are carried by the 5-ton trucks, and is cheaper to haul to New York with its 5-ton trucks, loaded with 3½ to 5 tons, than to ship by freight.

To ship to Boston by express costs more than to ship by trucks of 1 to 5 tons capacity, provided the 1-ton trucks are loaded to capacity, the 2-ton trucks carry ½ to 2 tons, the 3-ton trucks carry more than 1½ tons and the 5-ton trucks carry 1¾ tons or more.

Comparative figures are as follows:

Cost per Ton-Mile

	To Boston or New York By Motor Truck, Full Load	To Boston		To New York	
		Express	Freight	Express	Freight
	Cents	Cents	Cents	Cents	Cents
5-ton truck	6.9	20.8	15.2	17.6	10.4
3-ton truck	10.5				
2-ton truck	13.82				
¾-ton truck	17.15				

Cost per Ton-Mile by Truck With Various Loads

Load	5-ton Truck Cents	3-ton Truck Cents	2-ton Truck Cents	¾-ton Truck Cents
5 tons	6.9			
4 tons	8.6			
3½ tons	10.0			
3 tons	11.5	10.5		
2 tons	17.25	15.75	13.5-14.15	
1½ tons	23.0	21.0	18.0-19.0	
1 tons	34.6	31.5	27.0-28.3	17.08
¾ tons	51.0	42.0	36.0-37.5	22.75

No trailers are operated with the trucks as yet, but the company has been considering the use of trailers as a means of still further reducing its haulage costs.

Outgoing shipments from the factory consist of automobile and truck tires and sundries. Incoming shipments consist of tire fabric, litharge and valves. Following is an analysis of the freight and express costs, including haulage at both ends in the case of freight shipments and war tax on both freight and express shipments.

Itemized Freight Rates

Outgoing	New York Cents	Boston Cents
80% Tires at 63c per cwt.	50.4	50.4
20% Sundries at 42c per cwt.	8.4	8.4
War Tax at 3%	1.8	1.8
Hauling, per cwt.	45.0	40.0
Total	105.6	100.6
Incoming		
50% Fabric at 30.5c per cwt.	15.3	30.5
30% Litharge at 23c per cwt.	6.9	....
20% Valves at 36c per cwt.	7.2	....
War Tax at 3%	0.8	0.9
Hauling, per cwt.	20.0	20.0
Total	50.2	51.4
Average, per cwt.	77.9	76.0
Cost per ton-mile (rate x 20 divided by mileage)	10.4	15.2

Itemized Express Rates

Outgoing and Incoming	N.Y.	Boston
Express rate, per cwt.	126.0	99.0
War Tax at 5%	6.3	4.9
Total	132.3	103.9
Cost per ton-mile (rate x 20 divided by mileage)	17.6	20.8

Thus, it is cheaper for a company in

Rural Truck Line Seeks State O. K.

LANSING, MICH., July 17.—The first inter-city truck transportation company to make application for approval of its stock came before the Michigan public utilities commission Thursday. It will be known as the Western Michigan Motor Transit Company.

The association, which has not yet been incorporated, is composed of Casper C. Hayward, for himself personally, and as trustee, Paul C. Pomeroy and H. Monroe Dunham, all of Grand Rapids. The purpose of the concern is to haul freight and establish warehouses for storage in the cities between which it will operate 15 trucks. The trucks will ply between Grand Rapids, Hastings, Holland, Muskegon, Fremont, Grand Haven, Allegan, Hart, Shelby, Ionia, Greenville, Belding, Kalamazoo, Lowell, Big Rapids and Howard City.

Mr. Pomeroy, who is associated with the freight transportation department of the Packard Motor Car Co., and is selling the trucks to the new concern, said that it was capitalized at $100,000 of which $50,000 in stock has been subscribed, and $13,000 already paid for.

He estimates the average cost of transporting freight by motor truck will be a cent a mile per 100 lb.

Pennsylvania Range Boiler Co., Tenth St. above Norris, Philadelphia, Pa., announces that it has opened a department to do repair work of welding or brazing.



United States Tires
Are Good Tires

A Compliment Paid

Out of 1,857 entries, the 1½-ton truck owned by the What Cheer Chemical Company won the Packard National Efficiency Test on UNITED STATES TIRES.

Mind, these tires had already delivered a mighty good mileage before the contest, but Drury, the driver, decided to leave them on.

We quote his own words, "front tires have run more than 16,000 miles—rear over 14,000. All in good condition, and look like 20,000 miles more."

Here's real mileage to offer your trade, the kind that reduces maintenance costs and makes friends.

UNITED STATES RUBBER COMPANY
US
AND ASSOCIATED COMPANIES

Proper Loading Methods and No Idle Moments Make Short-Haul Work a Success

By C. S. PERRIE

An example of the possibilities of motor trucks in short haul work is the use of two 2-ton trucks, a Selden and GMC, by the E. B. & A. C. Whiting Co., Burlington, Vt. This concern imports and manufactures brush fibers and is reputed to do 90 per cent. of the fiber business in the United States. It is an old concern with a plant covering several acres of ground on the outskirts of Burlington, and it maintains a number of warehouses for the stocking of the raw material. These buildings are situated from one-quarter to three-quarters of a mile from the main plant or factory.

Large Stocks of Material

The raw material, fiber and the hair for brushes, comes from all over the world, the long fiber being obtained principally from Tampico, Mexico, while another variety of material is secured from Africa. The different types of hair come from Russia, India, China, etc. The material varies in price and quality. It is made up into what is termed stock; that is, cut to prescribed lengths and put up in round packages.

The fiber or raw material comes in car load lots. It is sent by rail to the main freight line at Burlington, thence to the various warehouses adjoining the plant by means of a siding or spur. The raw fiber comes in lengths varying from 16 to 20 in. and in bales weighing about 250 lb. An interesting sidelight is the attempt of the Mexicans to put something over in the way of weights by placing stones in the middle of the bales. It is wasted energy, however, as each bale is examined and contents weighed and the weight of the stones and other foreign matter deducted. After the fiber is sorted, it is hackled and cut to the required lengths by special machinery, after which it goes to the mixing machine. It is polished, trimmed and dyed, put up in round packages, wrapped with paper and finally packed in boxes containing about 250 lb. There is solid and tapering stock, etc.

The more expensive hair comes in small lots to the freight or express office and some of the material costs in the neighborhood of $5 the lb. The finished products are shipped to all parts of the world and on the day the writer visited the plant one of the motor trucks hauled a load to the railroad for shipment to India.

Up to within two years ago horses were used for hauling the raw and finished material between the warehouses and plant and to and from the railroad, which is about a mile from the factory. At that time the company had three two-horse teams and hired as many others as were required. The increasing volume of business, which assumed large proportions during the war—the factory operating a night and day shift—led to the placing in use of a 2-ton GMC truck and a year later a Selden was added and use of the horses discontinued.



The GMC Truck Alongside the Loading Platform and Showing a Consignment of Finished Goods Destined for India.

All Short Hauls

The longest pull of the trucks is less than two miles, to a broom mill, a subsidiary of the company. The next longest haul is to the railroad, and the others are to warehouses Nos. 1, 2 and 3, three-quarters, one-half and one-quarter miles respectively. The shortest hauls are those in and around the warehouses at the plant. Here the distances are so short that the truck is placed at a disadvantage over other forms of transportation. Yet, despite this, Superintendent W. P. Carroll informed the writer that an estimate of costs showed that the trucks were effecting a saving of over 50 per cent. when compared with horses. The estimate is based on the present cost of horses.

Trucks Operated Efficiently

When Mr. Carroll, an old railroad man, assumed charge of the transportation, he made several changes in the routing of the trucks with the result that they are operated both ways with practical capacity loads, with the exception of the short hauls from the warehouses. Instead of using three men on the trucks as was formerly the case, two are now used, and further economy is obtained by one of the drivers operating a fiber machine while his truck is being loaded at the warehouses adjoining the plant, and while the truck is being loaded and unloaded at the platforms. This is unusual, but it decreases the cost of the driver, as his machine time is credited.

The trucks haul the finished product to the railroad, carrying on an average of 25 boxes the load or a gross load of 6750 lb. On the return trip the machines stop at the warehouses and bring back bags of fiber, carrying from 15 to 25 bales. These bales are bulky, as may



Loading the Fiber at a Warehouse. The Truck Carries From Fifteen to Twenty-Five Bales, and a Bale Weighs About Two Hundred and Fifty Pounds



These photographs show the great change in freight traffic on Brooklyn Bridge during the past fifteen years —a change that is coincident with the great developments in automobile tire manufacture, and the better service delivered by the dependable tires of today.

THE fact that Fisk Over-Size Cord Truck Tires are going onto more business trucks every day is a significant commentary on their durability, their long mileage and low upkeep cost.



Tires on trucks are subject to accurate cost accounting—and business men buy those tires which serve them best.

Fisk Over-Size Truck Cords are massive with remarkable wear resistance and long life built into them by the maker.

Everywhere Fisk sales are growing.

FISK TRUCK TIRES

be noted in an accompanying illustration showing the truck being loaded at a storehouse.

Keep Plants Supplied

The trucks also haul raw material and supplies to the broom factory and carry the finished product to the railroad. The secret of the success obtained is due to the routing of the machines. Mr. Carroll has arranged the work so that the trucks are rarely idle and generally carrying material either way. The finished goods are brought to a special loading platform by a hand truck devised by Mr. Carroll, and no time is wasted in turning or backing, as is generally the case where motor trucks have replaced horse drawn equipment and where the loading conditions are not changed to care for the speed of the mechanical transport.

The trucks have proved their utility time and time again in the rush work during the war, the drivers working overtime to keep the plants supplied with the raw material and making deliveries to the railroad. The writer was informed that two shifts of horses would have been required. During the busy period it was not uncommon for a truck to haul 100 bales of fiber in the morning and 50 in the afternoon, in addition to the regular work, which included carrying finished goods to the railroad and hauling supplies, etc., from the freight house to the fiber plant and broom factory. Cost figures could not be obtained, but the statement that the trucks are effecting a saving of 50 per cent. over horses indicates the possibilities of short haul work with trucks when careful consideration is paid to proper loading methods and avoiding idle moments. Operating on the return trip empty may well be classed as idle or waste time.

New Autocar Model on Test Run

Starting from Washington one week after the trans-continental army convoy's tour, the Autocar Co. of Ardmore, Pa., is sending over practically the same route its new 3½-ton 4-cylinder Autocar model accompanied by one of the standard 1½- to 2-ton Autocars with the 120-in. wheelbase.

The two machines left Ardmore, Pa., July 14 for Washington. They proceeded from there to Chambersburg, Pa. From Chambersburg their route follows the Lincoln Highway through Pittsburgh and Chicago to Cheyenne, Wyo. From Cheyenne a detour will be made to Denver, Colo., and Pike's Peak, the ascent of which both trucks will make. The route will then extend back to Cheyenne and from their via the Lincoln Highway directly to San Francisco. From there the two trucks will visit the various Autocar factory branches in California, finishing the test run at Los Angeles.

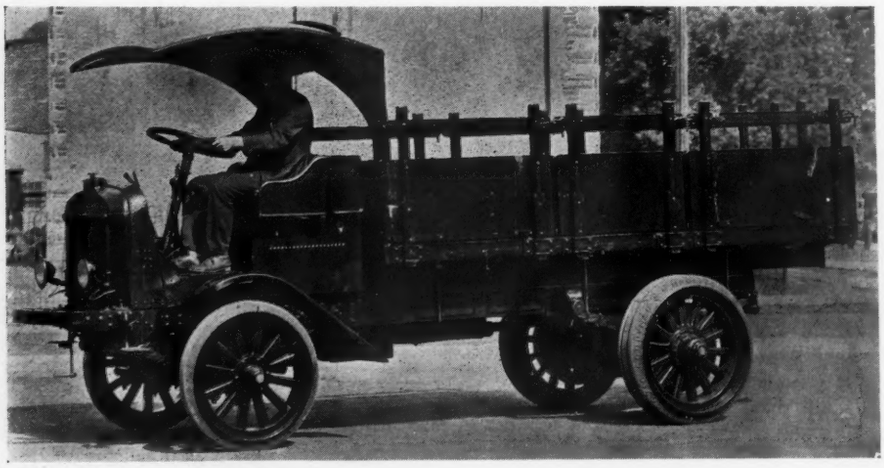
This run is purely an engineering test and both trucks will be loaded to capacity at all times. This 3½-ton truck has already covered 22,000 miles and is now being put through this 4000 mile trip under the severest possible conditions as a final test. The new model will not be available for distribution before the first of the year. It is equipped with a four-cylinder engine of 25.6 hp., S. A. E. rating. The chassis weighs 6150 lb. and will be furnished with an optional wheelbase of 120 or 144 in. Starting and lighting systems are also optional.

The engineers of The Autocar Co., who will make the entire trip are: A. B. Cumner, of Washington; A. K. Braumbaugh, of Ardmore, Pa.; F. J. Gardener, of Baltimore, and George Hay, of Ardmore, Pa.

Every farmer and manufacturer and dealer in the country could be sold a truck or a battery of them, if they would only keep cost books and make comparisons. As a rule, they don't know what a haulage system costs one way or the other. I'm beginning to think that the small consumer is a better business bookkeeper than his brother who supplies the stuff. How can you tell whether a thing pays or is a loss, unless you have a speedometer on the business?

Build Now

The National, State, and County Roads we need, and prosperity will ride to every American's gate.



The New Autocar Which is Making a Transcontinental Tour as an Engineering Test Before Being Placed on the Market

New York Reconstruction Commission Endorses Rural Express

In a report which is now on its way to Governor Smith, the Committee on Food Production and Distribution of the New York State Reconstruction Commission, strongly recommends the operation of rural motor truck express systems throughout the state for delivering perishable foods, these systems preferably to be owned by a co-operative association similar to the Farmers' Co-operative Company of Hartford County (Maryland), Inc.

As an agency for the promotion and direction of this movement the New York State Reconstruction Commission recommends to the Governor that a temporary non-salaried State Highways Transport Committee be appointed—which commission shall include the Commissioner of Highways, a representative of the State College of Agriculture or the County Farm Bureau Organization, a representative of the State Department of Farms and Markets, and two other disinterested men.

The report proves by concrete examples the effectiveness of the motor truck express as it has been demonstrated in various sections of the United States. One instance cites the delivery within twelve hours at New York of a motor truck coming from Lancaster, Pa., with 18,000 eggs and 1000 day-old chicks with the loss of four chicks and nine eggs—whereas the same order sent by train was four days reaching Jersey City, another day before the consignee was notified of its arrival, plus a delay caused by the consignee's having to send his own truck for the shipment. When it finally reached its destination half the chicks were dead and thousands of eggs were broken.

More than 600 motor truck lines are now in successful operation in the United States. There are 22 motor truck lines now operating in Maryland and 150 in California. The entire State of Iowa has been divided into districts and each district mapped out in motor truck routes.

In reply to a questionnaire sent to leading farmers the New York State Reconstruction Commission has received hearty endorsement of the rural motor truck idea in every county of the state, especially Wyoming, Allegany, Albany, Rennselaer, and the fruit and vegetable regions, such as Delaware, Sullivan, Dutchess, Putnam, and so forth. New York State is especially well equipped for the development of this system because of its excellent roads.

It is estimated that under fair conditions foodstuffs can be delivered by motor truck at three-fifths the cost of delivery by train, but the report points out that no two routes are enough alike to warrant a definite statement of average cost, at least until something approaching a standardized cost system has been generally established by the lines now in operation.



The Hoover Laboratories First Make Sure That the Raw Steel is of the Proper Quality

Advanced ball making equipment and methods characterize the great Hoover Plant. Neither work nor money has been spared to produce the best steel balls in the world.

But no matter how thorough the Hoover shops may be, regardless of the modern equipment, all would be for naught were it not for the guidance of the Hoover laboratories.

Complete research and control laboratories are an integral part of the Hoover plant, a precaution (we deem it a necessity) not recognized by any other ball makers in this country.

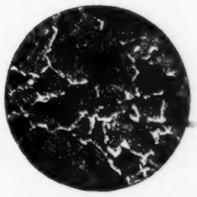
The work of these laboratories is widely diversified. Primarily they run elaborate tests of each lot of raw steel received from the mills. It must measure up to the established Hoover standard specifications.

These engineers test for decarbonization, seams and laps, extreme hardness and for variation in sizes, and by guarding every operation of manufacture the established high quality of Hoover Steel Balls is maintained.

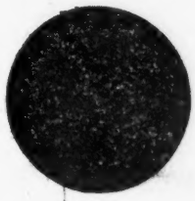
One of their essential functions is to guard against defective stock *before* it has been fabricated into Hoover steel balls.

Obviously, there results more efficient production, less waste in labor and materials, and surety of uniform quality.

Too much stress cannot be put upon the importance of the Hoover laboratories. Their success has made possible the success of the Hoover Steel Balls.



A



B

The heat treatment of the steel which we receive has an important effect upon the quality of Hoover Steel Balls.

Photograph A shows improper annealing of steel wire. Such a structure would make a weak ball.

Photograph B shows proper annealing, the use of which results in a ball possessing the desired qualities.

Steel Balls for Every Requirement

There are Hoover Balls for every bearing requirement. So rapidly and constantly is the ball bearing industry progressing that only the complete organization can possibly keep pace. With the determination always to excel, the Hoover Steel Ball Company is bound to retain its position of leadership.

Hoover Steel Ball Company
Ann Arbor, Michigan

HOOVER
STEEL BALLS

Motor Truck Facilitates Work of Wholesale Meat Houses in Maine

By C. P. SHATTUCK

LEWISTON, the second largest city in Maine, across the river from Auburn, depends to a great extent upon the surrounding country for its fresh meat. There are no less than five companies operating as wholesale meat houses that purchase live stock, kill and dress it, and distribute it to the retail stores. There are, of course, branches of the well-known packing houses both in Auburn and Lewiston, but the local concerns transact a considerable volume of business that is on the increase.

No Rural Express Service

There is no Rural Motor Express service to supply Lewiston or Auburn for that matter. Neither are there any motor trucks being operated on inter-city work. There are truck operators who will haul furniture, etc., but none provides a service between the cities, as is the case in other sections of New England. Because of the lack of a motor highway transportation service or Rural Express there is no connecting link between the agricultural sections and Lewiston other than the railroad and horse-drawn equipment, the former being utilized for long hauls and the horses for short hauls.

Enter the Motor Truck

Up to within a few years ago, the Lewiston packers or wholesale meat companies relied upon the railroads to bring in live stock from the surrounding country. Horses were employed to cover a radius of twelve miles or so. It should be explained that the packing houses employ buyers who travel the country within a radius of sometimes 100 miles. These men purchase live stock, hogs, calves, lambs, steers, etc., which are shipped by freight.

In addition to the buyers of the Lewiston concerns there are what are termed independent buyers, men who purchase from the farmer, kill and dress, and sell to the retail stores. Sometimes these buyers sell direct to the slaughter house. All of these formerly relied upon the horse, but with the introduction of the automobile for canvassing the country, the horse gave way to the gasoline propelled vehicle and finally the motor truck, for, with the latter, the buyer could pick up his live stock as he went along. Today there are few buyers who have survived with the horse. As one expressed himself: "We had to use trucks, for we found that the other fellow beat us to it and cleaned up while we were on our way."

Trucks Effect Big Saving

A concrete example of the value of trucks in the business above referred to is given by J. P. Sutton Co., Lewiston, wholesale meat dealers of 16 years' experience. This concern buys live stock, hogs, calves, lambs, steers, etc., and kills and dresses them. Its products include bacon, ham, sausage, etc., and has two Vim trucks in service.

For years the buyers of this company used horses for covering the country surrounding Lewiston. Some idea of the maximum efficiency of the transportation may be obtained by contrasting work of the Vim truck with that of the horses in bringing hogs from North Monmouth, 16 miles from Lewiston. According to M. G. Frost, of the J. P. Sutton Co., and for 15 years the principal buyer, it would take the horses a day to make the round trip of 32 miles; that is, from the time the horses left the slaughter house until they returned at night with the stock.

Trucks Make Trip in Two Hours

The writer was invited to make a trip with one of the buyers to North Monmouth, where hogs were to be purchased. The Vim truck left Lewiston at two in the afternoon and following the State highway went through Winthrop, then turned off and traversed some of Maine's unimproved roads to the farmer's house. Imagine a miniature battlefield with its shell craters and you have a fair idea of that road. The writer's comments highly amused the driver, who said it wasn't so bad when compared with some he traveled and that the road was in pretty good shape, and that it ought to be driven over right after a real smart rain.

Take on a Couple of Hogs

We found the farmer awaiting us and the Vim was backed up to the pig pen and the hogs loaded on. This process is interesting. A plank is laid from the truck to the pen. The farmer takes a large metal tub and sticks it over the head of the hog, while another man grabs his tail, using the caudal appendage to guide the animal. The idea of the tub is to make the hog back away, which he does, into the truck.

Another call was made at another farm house a couple of miles distant for some lambs, but after dickering quite a while, the farmer decided he would winter his stock. The dickering is a part of every purchasing ceremony. It starts with a general exchange of comments on crop and cattle conditions, fairs, etc., then finally the barter begins. Not infrequently the buyer and farmer fail to make a deal on the spot, but later the farmer will call up by telephone and either accept the price or offer to split the difference. These Maine farmers are keen merchandisers.

At four o'clock the truck was back and the hogs unloaded, having covered 32 miles, including stops, in two hours. The trip is an average example of the work accomplished by the truck and several similar trips a day are made. Another trip was made by the writer to Turner, about 12 miles distant, where a farmer was picked up and a trip made through a cart path in the woods to a pasture, where two head of steers were bought. These were driven in by the owner, as the trucks are not used for heavy cattle.

The oldest truck has been in service three years, the present summer being its fourth. Mr. Frost has covered a



Loading Mr. Hog Into the Vim Truck. He is Persuaded by Means of a Metal Tub Over His Head and Guided by the Driver

"The Resiliency is Built in the Wheel"

The Wheel

that has been universally accepted by thousands of

Motor Truck Operators

Increasing Orders

From motor truck manufacturers and dealers is the best proof we can offer as to the universal acceptance of SEWELL CUSHION WHEELS by motor truck operators.

Not an Experiment

SEWELL CUSHION WHEELS are not an experiment. They are a proven product of eleven years development in "Building Resiliency in Motor Truck Wheels."

94% Pure Para Rubber

A truck equipped with SEWELL CUSHION WHEELS actually rides on a rubber road-bed of 94% Pure Para Rubber built in the wheel.

Five-Year Guarantee

SEWELL CUSHION WHEELS are built to last the life of a truck and carry a five-year guarantee.

28,000 in Operation

Evidence as to the satisfaction and acceptance of SEWELL CUSHION WHEELS is established in the fact that 28,000 are in actual operation today on all makes and sizes of trucks.

SEWELL CUSHION WHEELS are the proven Standard of Motor Truck Economy.

Motor Truck dealers or operators who are not entirely familiar with the advantages and simplicity of applying SEWELL CUSHION WHEELS will be furnished full information and particulars on request.

SEWELL CUSHION WHEEL COMPANY, DETROIT, U.S.A.

Branches:

Atlanta, Ga.	Clarksburg, W. Va.	Kansas City, Mo.	New York, N. Y.	Springfield, Mass.
Baltimore, Md.	Cleveland, Ohio	Los Angeles, Cal.	Philadelphia, Pa.	St. Louis, Mo.
Boston, Mass.	Columbus, Ohio	Louisville, Ky.	Pittsburgh, Pa.	Tampa, Fla.
Buffalo, N. Y.	Dayton, Ohio	Minneapolis, Minn.	Rochester, N. Y.	Toledo, Ohio.
Chicago, Ill.	Denver, Colo.	Newark, N. J.	Seattle, Wash.	Washington, D. C.
Cincinnati, Ohio	Indianapolis, Ind.			

radius of 125 miles with it, buying car load lots of cattle and hogs, and one of these trips was to Whitefield, N. H., 125 miles distant. He bought and had shipped by rail two car loads of cattle and hauled back in the truck 1200 lb. of live hogs, making the run back to Lewiston in seven hours. The Vim truck has made possible the covering of a greater distance in considerably less time than by the former methods, of the railroad and the horse. It has also reduced the cost of obtaining stock and has enabled taking advantage of market conditions, of buying when the farmer is in the mood to sell and before the price rises. A day or two frequently makes a difference.

Trucks Earn Money

The trucks earn money for the company, as the farmer is charged for transporting the hogs, calves, lambs, etc., to the slaughter house, the price varying per head and the tariff is based on approximately 15 cents the mile each way, so that the truck is not operated at a loss on the out trip. The picking up of the live stock is appreciated by the farmer, who is saved the trouble of carting it to the railroad or driving to the city. The farmer aids in loading and receives a check from the company promptly after the stock is dressed and weighed, the price being for dressed, although in the case of cattle a price is agreed upon in advance for the animal.

Use Trucks for Delivery

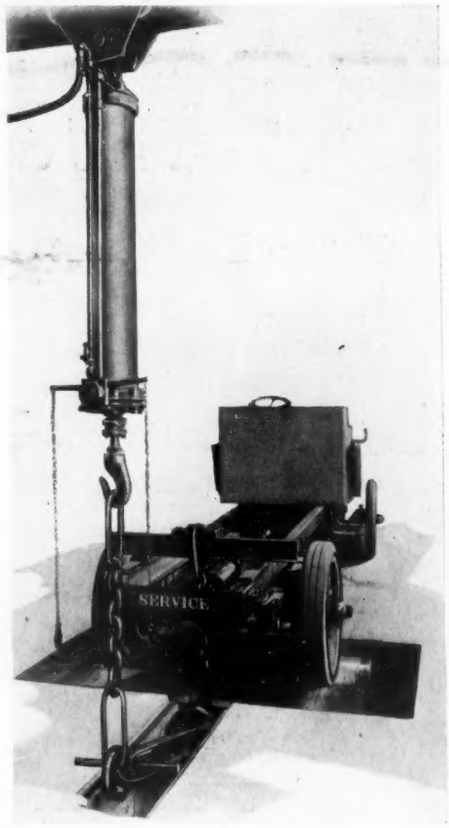
The truck is employed for delivery purposes when not hauling live stock, but it is used the greater part of the time by the buyer. The other truck is utilized for local deliveries, supplying the retail stores within a radius of three miles, which will cover Lewiston and its outskirts. Thus far the oldest truck has brought in over 40 hogs from North Monmouth alone and over 200 from the surrounding country. It has a record of over 100 calves during the veal season, in addition to other live stock transported.

Despite the character of the roads and the high rate of speed at which the trucks are operated, they have given wonderfully good service. The oldest truck has had but one overhaul and not a complete one at that, while the other has had nothing other than adjustments, grinding the valves and removing carbon. No record has been kept of mileage, nor of costs of operation and maintenance, but the two trucks are accomplishing the work formerly performed by six horses. In commenting on their performance and utility Mr. Frost said that when horses were used for delivery work in the morning they could not be employed to go out into the country picking up stock on the same day. Whenever either truck is idle in the afternoon, a trip is made into the country for live stock or for canvassing with results. An interesting angle of the use of the trucks is that they cannot always be operated the entire year for reasons which will be explained in another article dealing with the use of and possibilities of motor trucks in Maine.

Service Trucks Also Given a Stationary Road Test

The Service Motor Truck Co. not only makes stationary tests of each engine before it is put into the chassis, but it also applies similar principles to the testing of the whole driving mechanism of the truck.

The truck is driven over a pit in the concrete floor of the assembly building, until the rear wheels of the truck rest upon a series of two large rollers. The forward end of the lever arm, which is shown just back of the truck, is fastened to the frame just over the rear axle by means of chains and wood blocks. To the other end of the lever arm an air hoist is attached and when all is ready



This Test, to Which All Service Trucks Are Subjected, Before Leaving the Factory, Enabled the Engineers to Make Adjustments of Brake Bands, Bearings, etc., Before the Road Test is Given.

the hoist exerts a pull on the lever just sufficient to cause a pull-down on the frame equal to the rated load capacity of the truck. The engine is then started and the transmission thrown into gear in the usual manner of starting.

At this point the action of the truck is closely watched. The axles and springs are under load. The engine and driving members are working against certain resistance. Bearing adjustments are tested; alignment of the wheels is noted; brake bands are adjusted, and many other things are noted which it would be difficult to detect when bumping along the road.

Here's the Latest, the S. P. C. T.

We have societies for the prevention of cruelty to Old Dobbin and the Old Gray Mare; but who ever thought of a society for the prevention of cruelty to motor trucks!

Well, that is just what is suggested by Alfred F. Masury, chief engineer of the International Motor Co., manufacturer of Mack trucks.

"Just because a truck can't feel is no reason why it should not be handled with care," argued Mr. Masury with sympathetic fervor for the much abused, misused motor truck.

"The economy and efficiency of machinery lies in the way it is handled and treated. We need a society for the prevention of cruelty to our modern iron horses which feed on gasoline, just as we did for old consumers of hay and grain.

"Trucks need one kind of care in hot weather and another kind in cold weather.

"Straw hats are put on horses to protect them from the excessive heat of summer, but very often drivers will forget to see that there is sufficient water in the radiator and enough oil in the oiling system to lubricate the various bearing surfaces.

"In winter horses are sheltered from the cold in stables and given an extra amount of bedding, but very often a truck will be allowed to stand over night without the water being fully drained from the radiator.

"If the horse is neglected the animal suffers pain, and our humane societies see that it is stopped. But, if the truck is mistreated, it feels no pain and no one gives it any sympathy. The owner gets a severe pinch in his purse, and may hold up his right hand and swear, 'Never again.' But that is about as far as it goes. Users in general go on year after year, paying out large bills incurred through ignorance, carelessness and indifference.

"We need a society to educate users of motor trucks to their proper care, winter and summer, and in all kinds of weather. It will mean longer life for all trucks, greater efficiency and economy, better service and greater satisfaction.

More than a million pounds of freight was handled by auto trucks over the Highways Motor Transportation Co.'s lines in the Inland Empire during June. The tonnage passed the million pound mark by 63,000 lb. From July 1 to 19 the company handled 985,000 lb. Fourteen trucks are in operation. The company plans entering the passenger trade and nine vehicles for this purpose are in transit to Spokane.

Build Now!

Money spent wisely for good roads will come back, because the road will bring it back.

Buda AUTOMOTIVE Engines

It is commonly known that Buda Engine installation simplifies the selling of trucks and tractors.

Men who sell Buda-equipped tractors are telling us constantly that their prospects almost invariably take the quality of the engine for granted.

This confidence is based on a long and distinguished record of exceptional performance.

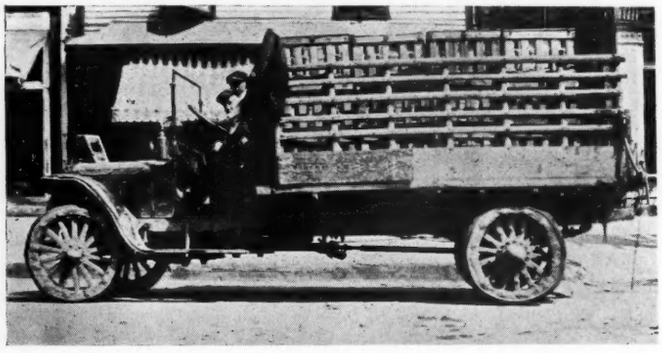
Accepted by the United States Government for the severest war service in France, Buda Engines were characterized by their unfailing reliability.

Unusual performance is not surprising when you consider there are 38 years of engineering and manufacturing experience behind the Buda Engine.

THE BUDA COMPANY, Harvey (Chicago Suburb), Ill.

Working Trucks Overtime and Competing With the Railroads

PRODUCE commission merchants and hauling contractors have developed an interesting plan for the Rural Truck Express in the vicinity of Philadelphia. This city draws upon a very large area of surrounding country for supplies of fruits, berries and other perishable farm produce. The southern part of New Jersey contributes largely to this food supply. The railroads give exceptionally good service in the way of fast freight, which is practically "express" service. One of the largest shipping stations for berries is at Hammonton, N. J., 30 miles from Philadelphia and Atlantic City.



Two-Ton Republic Used by F. A. Tomkinson to Haul Berries to the Market

During the season a market is maintained near the railroad station. The farmers bring their berries in in wagons or trucks. Buyers from the commission houses in Philadelphia and New York are there, as well as the buyers for canning factories. When a farmer arrives, the buyers look over the load and make offers. When a deal is made the buyer scribbles a memo. sales slip and tells the farmer where to take the load, either to a particular freight car or to one of the truck loading places. When the berries have been unloaded the farmer takes the receipt and the memo. sales slip to a representative of the buyer and gets his check. This feature of instant payment is much appreciated by the farmers, as they run no risk on market changes or on transportation.

Almost every imaginable form of conveyance is used to bring the berries to the market. Wheel-barrows for a crate or two; one-horse spring wagons, buggies, innumerable Fords and other touring cars. But all of the larger growers have their own trucks and every year the percentage of motor equipment increases.

Two railroads run to Philadelphia. The freight stations are one block apart. Each road furnishes overnight freight service to Philadelphia. Shipments made up to 5 p. m. are delivered in time for the early morning wholesale market. The rate of freight is 33 cents per hundred pounds.

In direct competition with this railroad service several trucks are running regularly carrying berries. Some of the hauling is done by local truck owners, who use their trucks for regular work during the day and make an extra trip to Philadelphia at night.

F. A. Tomkinson, who has four trucks for general hauling, uses a 3½-ton Rowe and a 2-ton Republic for hauling berries. Very often profitable return loads can be secured by bringing meat and produce down from the wholesale market.

This year there has been an unusual demand from the canning factories for berries for syrups and flavors. In former years the canners did not buy until the season was at its height and they would buy only at a very low price. This year the buyers for canning factories are right in the market buying in large quantities and paying current prices for good berries. Almost all of the berries for the canning factories are hauled in trucks. Some of the canners have their own trucks and arrange with buyers to have a load or two every day. Others hire trucks to do this hauling. Tell Bros. are hauling regularly to Glassboro, carrying 100 to 125 crates to a load on 2½-ton Bethlehem trucks. F. A. Tomkinson is also hauling berries to the cannery at Elm, N. J., three miles away. He carries 150 crates on a 3½-ton truck.

The Lanning cannery at Bridgeton, N. J., uses berries from this market. The hauling is done by a 3¼-ton Velie truck and a 2-ton Brockway. These trucks frequently make two round trips a day from Bridgeton to Hammonton.

Other points drawing supplies from this market by truck are Daretown, Burlington and Trenton.

Trucks belonging to Philadelphia commission merchants are truly "running night and day" in the berry season. The trucks haul shipments from the city freight stations to the store for the early morning market. Then they deliver the purchases to the customers in the city during the day. Late in the afternoon they make the trip to Hammonton, returning with a load of berries in time for the market. This means practically a double day for the truck, as the hauling in Philadelphia is a day's work and the 60-mile trip is another one. These trucks carry general produce and fruit on the trip to Hammonton, which adds to the income of the truck for the round trip. Thos. Battles, of Philadelphia, operates a 3½-ton Rowe every day, carrying 150 to 180 crates on the trip to Philadelphia.

A few truck owners buy for their own account in the market, cart the berries to some of the seashore resorts and sell them. This is another variation of the rural express made necessary by the local method of selling on the spot in the market. Farmers would not be willing to take a chance on shipping to the seashore markets, taking whatever their berries bring in the market, when they can sell immediately for cash. Herbert Brownlee buys berries for cash in the market at Hammonton and sells them in Ocean City, N. J., 40 miles away. He used a remodelled Ford touring car for several years. Now he has a ¾-ton Olds with pneumatic tires.

All of the trucks on this work are grossly overloaded. The roads are good and there are no hills, which may explain how loads of 1½ and 2 times rated ca-



The Big Trucks Used for Carrying Berries From Hammonton to the Lanning Cannery at Bridgeton

The truck on the left is a 3½ ton Velie, while the other is a 2 ton Brockway



TO those who have known the service rendered by the individual organizations marketing the Hess-Bright deep-groove type of bearings, the S K F Self-aligning type, and the Atlas brand of steel balls, a massing of this experience and technical abilities will assure engineering co-operation of a practical and impartial character.

S K F Industries is now in position to undertake the examination of any technical problem involving the performance of the above-named products, without the possibility of manufacturing bias.

Our research work will constantly question existing standards for material, design, or application, and also to develop more exact data and methods for the solution of anti-friction problems.

S K F INDUSTRIES, INCORPORATED
Sales, Service and Research Division
165 Broadway, New York

SKF INDUSTRIES

Hess-Bright Ball Bearings
S K F Ball Bearings
Atlas Steel Balls
Gronkvist Chucks
Transmission Hangers

pacity can be carried regularly. A crate of berries weighs from 50 to 60 lb. It is quite customary to put 160 to 180 crates on a 3½-ton truck. That figures four to a little over five tons. Truck owners know and admit that constant overloading causes rapid depreciation, but figure that it pays to do it in a short rush season like the berry shipping season.

Very few of the trucks sold in the past are equipped with pneumatic tires, but practically all of the trucks now being sold to the growers are equipped with pneumatic tires. The popular sizes are one, one and one-half and two-ton capacities. The better pulling ability of trucks with pneumatic tires in soft sand is quite marked. This one fact is enough to decide in favor of pneumatics.

Official Figures in Chicago Show Great Increase in Motor Trucks

Figures furnished by City Collector Fossberg, of Chicago, to the Trailer Manufacturers' Association of America, from the records of licenses issued for vehicles, under the wheel tax law in that city, show that during the last four fiscal years ending April 30, 1919, the number of horse-drawn vehicles licensed decreased from 49,582 to 32,489, or 34¼ per cent., while the automobiles and motor trucks licensed increased from 43,129 to 77,332, or 77¾ per cent. in the same period.

There were slightly fewer motor vehicles, including motorcycles, in the city April 30, 1916, than there were horse-drawn vehicles, but at the end of April this year there were two and one-half times as many motor vehicles as horse-drawn. The changes have been fairly consistent, but the greatest increase of motor vehicles occurred in 1916-17, when 17,752 were added to the license list, and was followed, as might be expected, by the largest decrease in horse-drawn vehicles the next two years, when 6874 and 7107 disappeared from the records in the respective periods.

The highest percentage of increase during the four years was in motor trucks, buses and coaches of more than one-ton capacity, which increased 164 per cent., and the next largest increase was in motor delivery wagons, which increased 104.4 per cent. in number. On the other hand, the greatest decrease in horse-drawn vehicles was in one- and two-horse buggies, amounting to about 71 and 80 per cent., respectively.

The Chicago license bureau does not issue licenses covering trailers as used with automobiles and motor trucks and cannot give figures showing the number of trailers in use. It classes any passenger or commercial motor vehicle used for drawing a trailer as an "automobile truck." The trailers therefore are included in the figures for delivery wagons and trucks, and are probably responsible to a considerable extent for the high percentage of increase in these two classes.

The following table gives the record of licensed vehicles for the four years:

Vehicle License Issued by City of Chicago

	May 1 to April 30				
Class of Vehicle	1915 1916	1916 1917	1917 1918	1918 1919	% Decrease During 4 Yrs.
1-horse wagon	34,357	31,867	27,098	22,420	34.4
1-horse buggy	1,233	892	529	358	70.9
2-horse wagon	13,415	13,292	11,647	9,429	29.7
2-horse buggy or carriage	359	196	103	71	80.2
3-horse wagon	207	212	210	203	1.9
4-horse wagon	11	11	9	8	27.2
Total	49,582	46,470	39,596	32,489	34.25
					% Increase
Passenger auto, 35 hp. or less	32,441	45,565	55,689	57,599	77.5
Passenger auto, over 35 hp.	2,777	2,977	2,797	2,366	*14.8
Auto delivery wagon, capacity 1 ton or less	4,867	7,738	9,412	9,953	104.4
Auto truck, bus or coach, capacity more than 1 ton	2,517	3,792	5,423	6,648	164.1
Demonstrator	527	809	904	766	45.3
Total	43,129	60,881	74,225	77,332	77.75
Motorcycle	4,442	4,690	3,696	2,901	*52.9

NOTE: *Decreased.



This Manure Spreader Has a Capacity of Five Tons

The strange-looking outfit, illustrated above, shows how the transportation problem of one farmer was solved who needed a truck for other work besides fertilizing his farm. The apparatus is mounted on a 6 ton Packard chassis. The crane picks up manure from the ground and deposits it in the body. The spiked arrangement at the back is revolved by power derived from the engine. It breaks up the manure and spreads it evenly over the ground. When necessary, all the special attachments may be removed and the truck used for ordinary hauling purposes.

Fleet of Fifteen Emergency Trucks Installed by Boston Gas Co.

Special equipment to safeguard the citizens of Boston against asphyxiation, explosions and the numerous other dangers that are likely to arise where there is gas and fire, has been installed by the Boston Consolidated Gas Co. The equipment consists of fifteen emergency motor trucks, each of which is fitted out with all the tools and materials necessary to cope with anything from a gas leak to a conflagration. The cars are stationed in different sections of the city, responding to every tap of the fire gong that signals danger in their district. In addition they are subject to call for every gas leak of consequence. Each car carries a carefully picked crew of three men.

All the trucks are built on Dodge Brothers chassis. Each truck carries as a part of its equipment, a pulmotor for use in resuscitating persons overcome by gas or smoke; two gas masks which enable the wearer to penetrate dense gas or smoke, or even ammonia fumes, with comparative safety; every sort of emergency tool for work on gas pipes and mains, including a variety of wrenches, bars and hammers; two fire extinguishers; a ladder to be employed in descending into cellars and man holes; rescue ropes, rubber boots and coats, and a first aid kit.

